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PHYTOLOGIA

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No.2

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BOTANICAL GARDEN

A NEW SPECIES OF PYGMY *DROSERA* FROM WESTERN AUSTRALIA
AND A NOTE ON THE STATUS OF SECT. *BRYASTRUM* AND
SECT. *LAMPROLEPIS*

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ABSTRACT

Drosera mannii Cheek, a species widely known in cultivation as *Drosera* 'Bannister' since 1977 or earlier, is described. This opportunity is taken to re-evaluate the widely maintained distinction between *Drosera* sect. *Bryastrum* Planch. and *Drosera* sect. *Lamprolepis* Planch.

KEY WORDS: *Drosera*, Droseraceae, taxonomy, Australia.

The preparation of accounts of the cultivated species of *Drosera* for the European Garden Flora Project and the Royal Horticultural Society's new *Dictionary of Gardening* (both in prep.) prompted a critical examination of several taxa of pygmy *Drosera* of West Australian origin which lack species epithets and are known solely by cultivar names based on the locality from which they were collected. Many of these have been widely cultivated in Europe and North America since the late 1970's. The first time that these were discussed was apparently by Rose (1977), who mentioned 9 such taxa: 'Toodyay Pink,' 'Mt. Many peaks,' 'Mucnea Pink,' 'Regan's Ford,' 'Lake Badgerup' (misprinted as 'Lake Badgebup'), 'Bannister,' 'Walyinga,' 'Brookton' and 'North Beermullah.' Slack (1979: 219) expounds upon the cultivation of many of these and others ('Millbrook Road' and 'Moora'), and it is clear that even then, several were well known in cultivation in Europe. Two additional cultivars, 'Gidgeganup Pink' and 'Gidgeganup White' were discussed by Lowrie (1980) and their introduction attributed to Rose. Although all these taxa seem to have been considered as putative new species by Rose (1977), investigation has shown that this is not so for all of them. *Drosera* 'Gidgeganup Pink' for example, is clearly only a pink strain of *Drosera scorpioides* Planch. and should be cited as *D. scorpioides* 'Gidgeganup Pink.' However, some of these taxa do seem to represent distinct species which are unaccounted for in the recent treatment of the genus in the *Flora of Australia* (Marchant, *et al.* 1982). Subsequently, one of these taxa ('Regan's Ford') has been described by Strid (1987) as *D. rechingeri*, but the bulk of the taxa are still botanically

unaccounted for. Although it is not possible, owing to lack of materials, to properly assess all of these taxa, it is plain that at least one of those still in widespread cultivation in Europe and America, described by both Rose (1977) and lengthily by Slack (1979) is undoubtedly specifically distinct. Accordingly, it is described as new here.

Drosera mannii Cheek, *sp. nov.* TYPUS: AUSTRALIA. West Australia: Cheek 2064 (HOLOTYPUS: K; Isotypi: PERTH,CANB,P).

Drosera 'Bannister' S. Rose, Carn. Pl. Newsl. 6(1):11. 1977.

A *Drosera leucoblasta* Bentham stylis 5 vel 6, stigmatibus sub-obclavatis, petalorum unguibus 1 mm et laminis retusimissis dif-fert.

Herbaceous, carnivorous, rosulate perennial. Stem short, unbranched, erect, base surrounded by marcescent leaves and stipules. Roots 3-7, wiry, largely adventitious, 0.2 mm thick and ca 5 cm long, dull red or orange above, straw coloured below with 5-11 lateral branches and numerous black, fine hairs ca 1.5 mm long. Leaves numerous, leaf blade elliptic, ca 2.5 mm long, 2 mm wide, concave in T.S., distal glandular hairs ca 4 mm long, proximal hairs ca 2 mm long, underside glabrous; petiole 3.5-4 mm long, 0.5-1 mm broad in plane view, dorsiventrally flattened, glabrous; stipules not detaching easily with the petioles from the stem, 3.5-4 mm long, 1 mm wide at the base, dividing ca 1.5 mm from the base into 3 main teeth, each spreading, triangular, 2 mm long with a lacinate margin, membranous-chartaceous, hyaline. Inflorescences 1-2, the sterile part 7-10 cm long, sub-glabrous, with extremely few, scattered, randomly directed, appressed white hairs, the upper 5-8 mm glandular hairy, the whole flushed dark red; fertile part 3-8.5 cm long, bearing up to 32 flowers, glandular hairy. Flowers 12-15 mm across, ascending. Sepals 5, ovate-elliptic, 2.5 mm long, 2 mm broad, acute-obtuse, very finely toothed, outer surface with red glandular hairs. Petals 5(-6-7), imbricate; petal blade oblong-obovate, 5-7(-8) mm long, 4.5-6 mm wide, apical notch 1 mm deep, the base truncate, palest pink (R.H.S. colour chart 'red-purple group' 62D), with a very thin red margin; petal stalk ca 1 mm long, broadest at tip, green. Stamens 5(-6) ascending; filaments 2.5-3 mm long, 0.25 mm wide at apex (which confluent with the connective), tapering to the base, white; anthers ca 0.3 mm long, with 2 separate thecae, inserted obliquely on either side of the swollen connective, purple; pollen orange. Ovary ca 0.75 mm diam, white. Styles 5-6(-7), 2 mm long, filiform. Stigma obconical to obclavate, 1.25 mm long, 0.5-0.75 mm wide, translucent white, style insertion ventral and oblique, 0-5 mm from base. Fruits with pedicels recurved, seeds unknown.

WESTERN AUSTRALIA: *ex cult.*, 1984 Adrian Slack from plants originally found by Phillip Mann at the side of the Bannister road, southwestern W. Australia, Cheek 2064 (HOLOTYPE: K; Isotypes: PERTH,CANB,P).

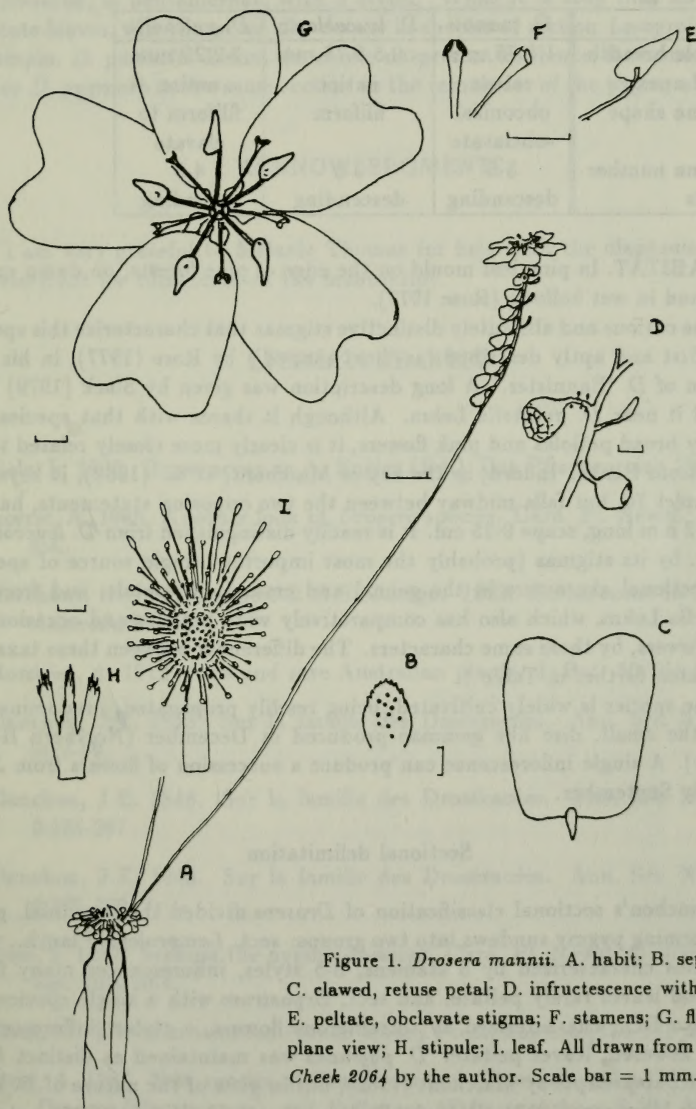


Figure 1. *Drosera mannii*. A. habit; B. sepal; C. clawed, retuse petal; D. infructescence with bract; E. peltate, obclavate stigma; F. stamens; G. flower in plane view; H. stipule; I. leaf. All drawn from Cheek 2064 by the author. Scale bar = 1 mm.

TABLE 1: Characters distinguishing *D. mannii*, *D. leucoblasta* and *D. pulchella*.

	<i>D. mannii</i>	<i>D. leucoblasta</i>	<i>D. pulchella</i>
Petiole breadth	1-0.75 mm	<0.5-0.75 mm	1-2.25 mm
Petal apex	retuse	entire	entire
Stigma shape	obconical -obclavate	filiform	filiform to clavate
Stigma number	5-6	3-5	4-5
Fruits	descending	descending	ascending

HABITAT. In pine leaf mould on the edge of pine forests, on damp creek-sides and in wet hollows (Rose 1977).

The curious and absolutely distinctive stigmas that characterize this species were first and aptly described (as 'boat-shaped') by Rose (1977), in his discussion of *D. 'Bannister.'* A long description was given by Slack (1979) who placed it near *D. pulchella* Lehm. Although it shares with that species unusually broad petioles and pink flowers, it is clearly more closely related to *D. leucoblasta* Benth. Indeed, in the key of Marchant, *et al.* (1982), it keys out to couplet 70, but falls midway between the two opposing statements, having styles 2 mm long, scape 9-15 cm. It is readily distinguished from *D. leucoblasta* Benth. by its stigmas (probably the most important single source of specific and sectional characters in the genus) and emarginate petals, and from *D. pulchella* Lehm. which also has comparatively wide petioles and occasionally pink flowers, by these same characters. The differences between these taxa are elucidated further in Table 1.

The species is widely cultivated, being readily propagated, predominantly from the small, disc like gemmae produced in December (Northern Hemisphere). A single inflorescence can produce a succession of flowers from June to early September.

Sectional delimitation

Planchon's sectional classification of *Drosera* divided the perennial, gemmae forming pygmy sundews into two groups: sect. *Lamprolepis* Planch., with 8 species characterized by 5 stamens, 3-5 styles, inflorescences many flowered and leaves rarely peltate, and sect. *Bryastrum* with a single species, *D. pygmaea* DC., characterized by tetramerous flowers, 4 styles, inflorescences single flowered, leaves peltate. *D. pygmaea* was maintained as distinct from section *Lamprolepis* by Marchant (1982), but in view of the nature of *D. occidentalis* Morrison (1912), *D. 'Lake Badgerup'* and *D. 'Warriup,'* the value of maintaining this distinction seems dubious. *D. occidentalis* has 1-2 flowered inflorescences with pentamerous flowers having 4-5 styles. *D. 'Lake Badgerup'*

usually has 1 flowered inflorescences, but occasionally produces up to 7 flowers per scape, the flowers being 4-5-merous, with 4 or 5 styles. *D.* 'Warriup' is unflowered, is pentamerous, with 3 styles. While it is true that all 3 have peltate leaves, this character also occurs in species of section *Lamprolepis*, for example, *D. pulchella* Lehm. In short, on present evidence, it seems best to place *D. pygmaea* in the same section as the remainder of the pygmy sundews.

ACKNOWLEDGMENTS

I am very grateful to Melanie Thomas for help with the diagnosis and to David Hunt for comments on the manuscript.

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TWO NEW SPECIES OF *BRICKELLIA* (ASTERACEAE: EUPATORIEAE) FROM NORTHERN MÉXICO

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ABSTRACT

Brickellia wendtii B. Turner, from northern Coahuila and *B. worthingtonii*, from southern Durango, are newly described and illustrated. The former, with nonplumose pappus bristles, is closely related to *B. secundiflora* (Lag.) A. Gray. The latter, with subplumose pappus bristles, is closely related to *B. oreithales* (B.L. Robins.) Shinnars.

KEY WORDS: *Brickellia*, Asteraceae, Eupatorieae, taxonomy, neotropical flora, México.

Preparation of a treatment of the genus *Brickellia* for México has necessitated description of the following two novelties.

Brickellia wendtii B. Turner, *sp. nov.*, Figure 1. TYPE: MÉXICO. Coahuila: Mpio. de Múzquiz, Rincón de Maria (28° 27' 30" N, 102° 04' W), "in roadbed at spring level in deciduous woodland," ca 1400 m, 23 Aug 1975, T. Wendt, E. Lott & D.H. Riskind 1264 (HOLOTYPE: TEX; Isotype: MEXU).

Brickellia secundiflorae (Lag.) A. Gray similis sed capitulis flosculis 10-14 in cyma terminali ramosa dispositis, pedunculis ultimis erectis 2-3 mm longis, receptaculis glabris, et acheniis 6.0-6.5 mm longis differt.

Many stemmed suffruticose perennial herbs to 1 m high. Stems densely glandular pubescent, mostly simple and arising from a woody rootstock. Leaves mostly opposite, 5-8 cm long, 2.5-4.0 cm wide, glandular pubescent; blades ovate, sparsely rough hispid above and below, glabrate with age, trinervate, the secondary veins weakly developed, the margins crenuloserrate; petioles 3-12 mm long. Heads ca 15 in a terminal open cyme, the ultimate peduncles mostly 2-3 cm long, densely glandular pubescent, erect or ascending. Involucres 12-13 mm high, turbocampanulate, the bracts 3-4 seriate, the apices acute or apiculate. Receptacle glabrous. Florets 11-12 per head; corollas ca 7 mm long, reportedly "creme green". Achenes 6.0-6.5 mm long, sparsely pubescent

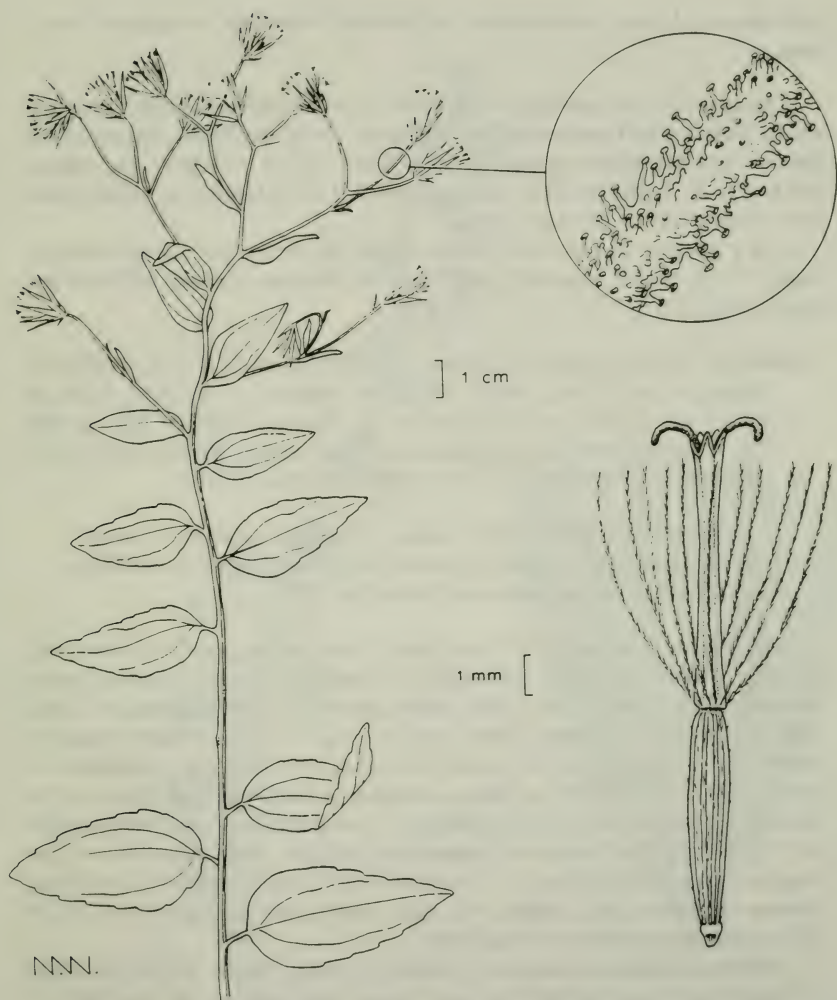


Fig. 1. *Brickellia wendtii*, from holotype.

with appressed hairs, the pappus of ca 40 white barbellate bristles ca 6 mm long.

The species is superficially similar to *B. secundiflora* but the heads are wholly terminal and nonpendulous, the florets fewer per head, the receptacle glabrous and the achenes longer. In Robinson's (1917) treatment, the species will key to *B. saltillensis* B.L. Robins., which I have treated as synonymous with *B. secundiflora* (Turner 1989).

It is a pleasure to name this distinct taxon for my friend and oft-time colleague, Dr. T. Wendt, currently working on the Mexican flora out of Chapingo, México (CHAPA).

Brickellia worthingtonii B. Turner, *sp. nov.*, Figure 2. TYPE: MÉXICO. Durango: ca 75 km S of Cd. Durango, highway to La Flor, 6 km by road from La Flor on the road to Cd. Durango (ca 23° 33' N, 104° 42' W), 8500-9000 ft, pine forests on rocky slopes, 18 Aug 1982, *R.D. Worthington 8838* (HOLOTYPE: TEX; Isotype: MEXU).

Brickellia oreithales (B.L. Robins.) Shinnery similis sed capitulis majoribus paucioribus in pedunculis ultimis longioribus et foliis ovatis 2-3-plo longioribus quam latioribus differt.

Slender perennial herbs 30-60 cm high. Stems simple, mostly unbranched, minutely scabrid hispidulous, arising from slender rhizomes. Leaves mostly alternate (only those at a few lower nodes opposite), 20-40 mm long, 8-12 mm wide; petioles 1-3 mm long; blades ovate to ovate elliptic, sparsely minutely scabridulous, especially on the nerves and along the margins, denticulate to nearly entire. Heads 6-10 per stem, arranged in simple secund racemes, the ultimate peduncles 1-4 cm long, drooping. Involucre narrowly campanulate, 12-14 mm long, the bracts ca tetraseriate, glabrate with puberulous-ciliate margins. Receptacle glabrous. Florets 10-11 per head; corollas 8-9 mm long. Achenes ca 4 mm long, densely sericeous throughout, the pappus of ca 35 white subplumose bristles 8-9 mm long.

Additional collection examined: México. Durango: Mpio. de Suchil, arroyo El Taray, Reserva de la Michilia, pine forest along arroyos, 20 Sep 1985, *J. Alvarado 44* (CIIDIR,TEX).

Because of its secund, drooping heads, the species superficially resembles *Brickellia secundiflora*. It is actually more closely related to *B. oreithales*, possessing the subplumose pappus and drooping heads of the latter, but differs markedly by its fewer larger heads and ovate leaves.

It is a pleasure to name this taxon for Dr. R.D. Worthington, Professor in the Department of Biology, University of Texas, El Paso, whose explorations in northern México have added several plant novelties to the region.

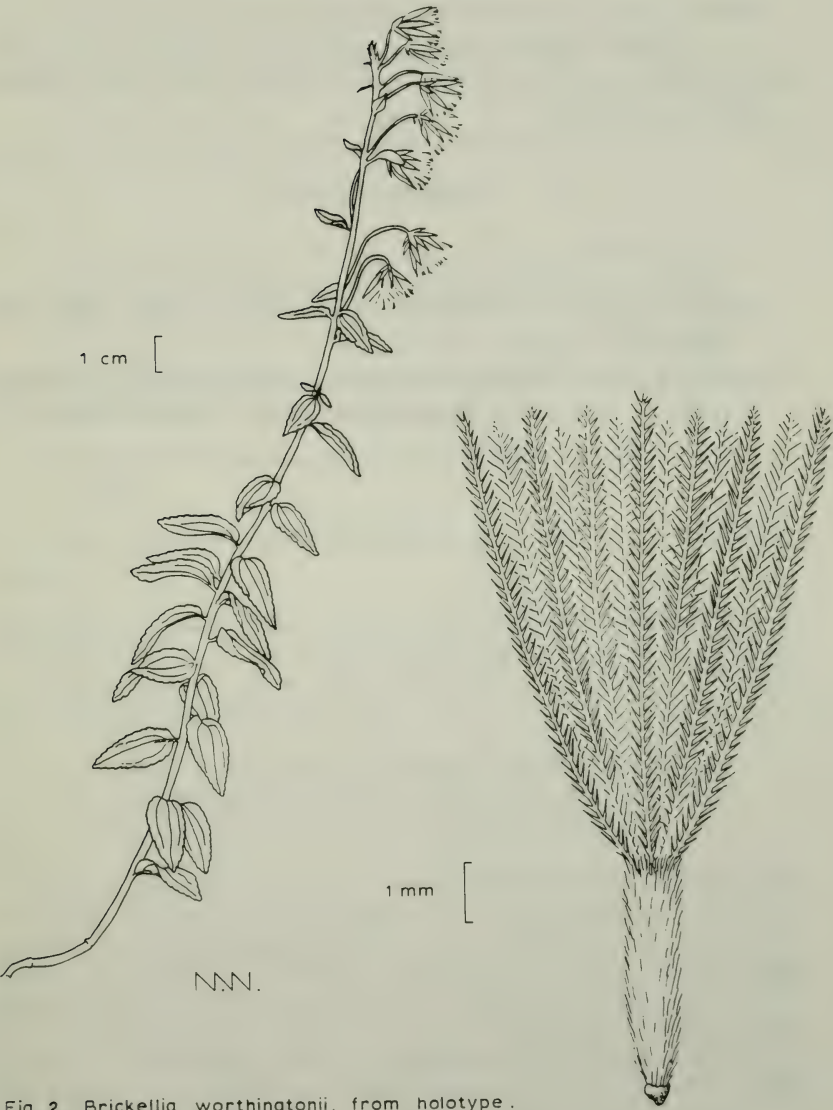


Fig. 2. *Brickellia worthingtonii*, from holotype.

ACKNOWLEDGMENTS

I am grateful to Dr. Guy Nesom for the Latin diagnoses and to both him and Dr. Carol Todzia for a review of the manuscript itself. Nancy Webber provided the illustrations.

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**AGERATINA MOOREI (ASTERACEAE: EUPATORIEAE), A NEW SPECIES
FROM THE STATE OF MÉXICO, MÉXICO**

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ABSTRACT

Ageratina moorei B. Turner, is described and illustrated. It is known from only two collections, both obtained in or near Valle del Bravo, western portion of the state of México. It is closely related to *A. cardiophylla* (B.L. Robins.) King & H. Robins., but is readily distinguished by its smaller habit, mostly basal leaves and smaller heads with fewer florets.

KEY WORDS: *Ageratina*, Asteraceae, Eupatorieae, taxonomy, Mexican flora.

Routine identification of Mexican Asteraceae has revealed the following novelty.

Ageratina moorei B. Turner, *sp. nov.*, Figure 1. TYPE: MÉXICO. México: Mpio. Valle del Bravo, moist ravine by Río Molino in pine-oak woods above reservoir, 1-2 Nov 1949, *H.E. Moore, Jr. & Max Cetto 5470* (HOLOTYPE: BH; Isotype: BH).

Ageratina cardiophyllae (B.L. Robins.) King & H. Robins. similis sed plantis minoribus (50-60 cm altis), foliis plerumque basalibus, et involucris brevioribus (5-6 mm vs 7-9 mm) differt.

Perennial herbs 50-60 cm high. Leaves opposite, mostly basal, the upper ones remote and much reduced; petioles 3-9 cm long, pubescent with crinkly spreading hairs; blades neatly cordate, mostly 5-13 cm long, 4-9 cm wide, 3-5 nervate from the base, moderately pubescent above and below, especially along the major veins, the margins rather evenly crenulate; heads numerous in rather open terminal cymes, the ultimate peduncles mostly 8-15 mm long, densely pubescent with glandular trichomes. Involucres turbocampanulate, mostly 5-6 mm high, the bracts glandular pubescent with acute apices. Receptacle plane, glabrous. Florets 13-16 per head, the corollas pinkish white, glabrous, ca 4



Fig.1. *Ageratina moorei*, from holotype.

mm long. Achenes 2.0-2.5 mm long, hispidulous; pappus of ca 20 fragile barbellate bristles 4-5 mm long in a single series.

Additional specimen examined: México. México: 15 mi E of Temascaltepec along highway 134, N facing slopes, S of highway, oak-pine woods, 28 Oct 1981, *M.J. Warnock 2591* (TEX).

The species is closely related to *A. cardiophylla* and *A. macvaughii* King & H. Robins., but can be distinguished from both by its smaller habit with leaves mostly basal. It is perhaps closest to *A. macvaughii*, possessing the small heads and florets of that species, but differs in habit, as noted, and by its neatly cordate leaves which are 3-5 palmately nerved from the very base, whilst those of *A. macvaughii* are 3-5 subpalmately nervate from above the base.

It is a pleasure to name this species for its first collector, the late Professor H.E. Moore, Jr., working out of the L.H. Bailey Hortorium, Cornell University. He assembled a rich set of collections from México over a 20 year period (mostly 1940-60).

ACKNOWLEDGMENTS

I am grateful to Dr. Guy Nesom for the Latin diagnosis and to him and Dr. T. Wendt for reviewing the manuscript itself. Ms. Nancy Webber provided the illustration.

TWO NEW SPECIES OF *VERBESINA* (ASTERACEAE:
HELIANTHEAE) FROM MÉXICO

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ABSTRACT

Two new species of *Verbesina*, *V. hidalgoana* B. Turner and *V. macdonaldii* B. Turner are described from Hidalgo and Oaxaca, México, respectively. *Verbesina hidalgoana* belongs to the section *Pseudomonstanoa*; the relationship of *V. macdonaldii* is obscure, apparently representing a very distinct element in the genus.

KEY WORDS: *Verbesina*, Asteraceae, Heliantheae, Hidalgo, Oaxaca, taxonomy, México.

Routine identification of Mexican Asteraceae has revealed the following novelties.

Verbesina hidalgoana B. Turner, *sp. nov.* TYPE: MÉXICO. Hidalgo: Mpio. Molango, vicinity of Molango on road to Lolotla, 1600 m, 9 Nov 1946, *H.E. Moore, Jr.* 1979 (HOLOTYPE: BH).

Verbesina fastigiatae B.L. Robins. & Greenm. multo similis sed foliis paucioribus omnino nonlobatis et capitulescentia multo pauciore foliis superis tantum parum longiore differt.

Suffruticose herbs or shrubs 1-2 m high. Stems hispidulous, narrowly winged throughout, the wings 0.5-1.0 mm wide. Leaves opposite throughout, 10-22 cm long, 5-10 cm wide; petioles 2-7 cm long; blades ovate-deltoid, gradually tapering upon the petioles, the latter winged throughout, rather coarsely pubescent above with broad based, recurved hairs, the undersurfaces coarsely hispidulous with straight hairs, especially along the venation, the margins serrulate, unlobed. Heads 20-50 in terminal congested cymose panicles, the ultimate peduncles mostly 3-15 mm long, the capitulescence 4-8 cm wide, 4-7 cm high, only slightly exceeding the upper foliage. Involucres turbocampanulate, 4-6 mm high, the bracts graduate, hispidulous. Ray florets 8-13, pistillate, fertile, the ligules yellow, 4-6 mm long. Disk florets ca 30; corollas yellow, the tube pubescent, ca 1 mm long, the throat glabrous, ca 3 mm long.

Achenes 4-5 mm long, glabrous or nearly so, the pappus of 2 awns 3-5 mm long.

Additional specimen examined: MÉXICO. Hidalgo: Mpio Zacualtipan, vicinity of Zacualtipan, rich mixed woods in ravine beside Río Teponapa, ca 2000 m, 20 Oct 1949, *H.E. Moore, Jr.* 5389 (BH).

Verbesina hidalgoana clearly belongs to the section *Pseudomontanoa* (Turner 1985) where it relates to *V. fastigiata* and *V. olsenii* B. Turner, differing from both in its smaller unlobed leaves and reduced capitulescence which barely exceeds the upper foliage.

***Verbesina macdonaldii* B. Turner, *sp. nov.*, Figure 1. TYPE: MÉXICO.**

Oaxaca: 35 km ESE of Miahuatlán, 5 km NE of Santo Domingo Ozoltepec, Cerro Quiexobra, timberline vegetation in open glades along ridges and in mountain "saddles," occasional on SE exposures, 3650-3800 m, (16° 10' N, 96° 15' W), 10 Dec 1989, *Andrew McDonald* 2936 (HOLOTYPE: TEX; Isotype: MEXU).

Verbesina oaxacanae DC. similis sed foliis oppositis crassioribus in paginis infernis dense appressi-pilosis et capitulis paucioribus involucri ca 1.5 cm altis differt.

Woody shrubs 2-3 m high. Stems densely pubescent, wingless. Leaves opposite, thick and leathery, 8-12 cm long, 3-4 cm wide; petioles thick, 2-4 mm long; blades mostly elliptical, somewhat bicolored, moderately hirsute and dark green above, densely pilose and dirty white beneath, the margin revolute, entire or nearly so. Heads radiate, arranged 3 to 4 in terminal cymes, the ultimate peduncles 3-6 cm long, thick and densely pilose. Involucre ca 1.5 cm high, ca 3 cm wide, 2-3 seriate, the outer bracts ovate-lanceolate, somewhat spreading, longer than those of the inner series. Receptacles convex, ca 8 mm across, the pales linear-oblongate, acute at the apices. Ray florets 13-21, neuter or pistillate, fertile or not, the ligules dark yellow, 11-15 mm long, 2-3 mm wide, the tube pubescent, ca 3 mm long. Disk florets numerous, the corollas yellow, ca 4.5 mm long, the tubes pilose, ca 1.5 mm long, the lobes 5, ca 0.6 mm long. Anther sacs purplish. Style branches with acute appendages. Achenes (somewhat immature?) ca 4 mm long, black, radially flattened, glabrous, ca 1.5 mm wide, wingless or seemingly so, a very narrow wing (ca 0.1 mm wide) along the upper shoulders; pappus of 2, readily deciduous, linear-lanceolate bristles 2.5-3.0 mm long.

A very distinct species, not readily related to yet others, but perhaps closest to *Verbesina liebmanni* Schultz-Bip. or *V. oaxacana* DC., both of which have smaller, more numerous heads and alternate leaves.

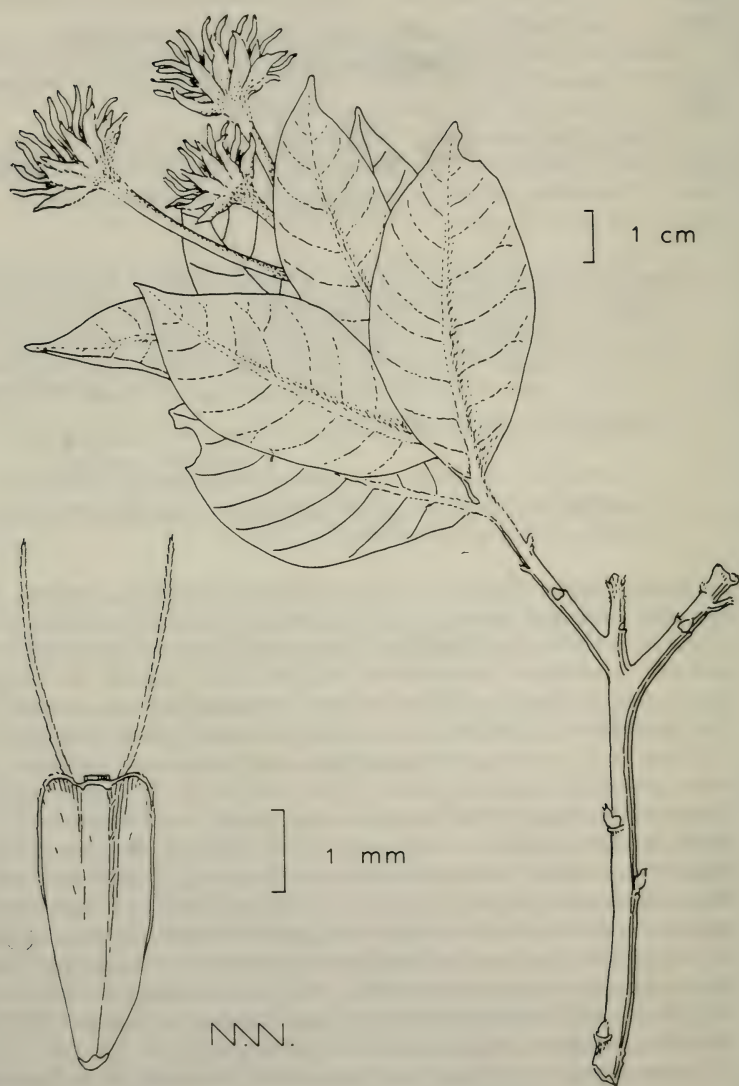


Fig.1 Verbesina macdonaldii, from holotype.

It is a pleasure to name this remarkably distinct species for its only known collector, Dr. Andrew McDonald, apparently the first professional systematist to ascend Cerro Quiexobra. Among his collection of Asteraceae from this first venture, seven new species were discovered (Nesom, in prep.; Turner, in prep.). Additional field work on this isolated mountain is certain to yield additional novelties.

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AIZOACEAE DE LA PENÍNSULA DE YUCATÁN, MÉXICO

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RESUMEN

Se presenta la descripción de la familia Aizoaceae para la Península de Yucatán, México (Estados de Yucatán, Campeche y Quintana Roo). Se describe taxonómicamente a *Sesuvium portulacastrum* y a *Trianthema portulacastrum*; se presentan datos de su distribución y ejemplares examinados.

ABSTRACT

A description of Aizoaceae from the Yucatán Península of México (states of Yucatán, Campeche and Quintana Roo) is presented. Taxonomic descriptions of *Sesuvium portulacastrum* and *Trianthema portulacastrum*, along with data about their distribution and a list of specimens examined are presented.

PALABRAS CLAVE (KEY WORDS): Aizoaceae, *Sesuvium portulacastrum*, *Trianthema portulacastrum*, Yucatán, Campeche, Quintana Roo, México.

INTRODUCCIÓN

Los miembros familia Aizoaceae Rudolphi se caracterizan por ser hierbas o subarborescentes anuales o perennes; con hojas suculentas; flores solitarias, actinomorfas y hermafroditas, tépalos y estambres mas o menos numerosos, ovario superior a inferior, plurilocular, ocasionalmente unilocular, número de estilos igual al de lóculos en el ovario, pocos a numerosos óvulos en cada lóculo o solitarios y el fruto capsular, locular o circuncisil con semillas pequeñas y numerosas (Rico-Gray 1979; Rzedowski 1979).

Se considera que esta familia tuvo su origen y diferenciación en el oeste del antiguo continente de Gondwana, entre los periodos Paleoceno y Eoceno (Raven & Axelrod 1974). Es una familia básicamente africana, pero se le encuentra bien representada en el Mediterráneo, en Australia y en las regiones secas de los trópicos y subtropicos de ambos hemisferios.

La familia Aizoaceae presenta alrededor de 11 géneros, dependiendo de los límites que se adopten, y aproximadamente 2,500 especies (Lundell & Lundell 1983; Standley & Steyermark 1946). En Norteamérica se encuentran cinco géneros, dos de los cuales crecen silvestres en la Península de Yucatán (Sosa, *et al.* 1985; Standley 1930).

En México tenemos la presencia del género *Mesembryanthemum* (*M. crystallinum* L., *M. blandum* Haworth, *M. chilense* Mol., *M. cordifolium* L., *M. nodiflorum* L.), originario del sur de África. Algunas especies de este género se utilizan como plantas de ornato, como es el caso de *M. cordiflorum* y *M. crystallinum*, conocidos en diferentes lugares como "siempre viva." Estas especies se caracterizan por presentar el cáliz pentalobulado y numerosos pétalos de color rosa-rojo muy intenso y hojas ovadas o cordeadas; las flores son un poco mayores que en las especies de los géneros silvestres.

CLAVE PARA GÉNEROS DE AIZOACEAE DE YUCATÁN

Clave para géneros de la Familia Aizoaceae presentes en la Península de Yucatán:

1. Ovario con 3-5 lóculos; semillas numerosas; estambres 5-numerosos; hojas de un mismo par mas o menos del mismo tamaño, linear lanceoladas, exestipuladas *Sesuvium*
- 1' Ovario con 1 ó 2 lóculos; semillas pocas; estambres 5-10; hojas de un mismo par de diferente tamaño, elíptico-lanceoladas, las estípulas escarposas *Trianthema*

SESUVIUM L., *Syst. Nat.*, ed. 10. 1058. 1759.

Plantas postradas o ascendentes, suculentas, glabras; varios tallos alternos originados de una corta raíz típica, por lo general de color rosa-morados. Hojas opuestas, las del mismo par mas o menos de igual tamaño, la lámina cilíndrica a mas o menos plana, el margen entero, exestipuladas; peciolo dilatado. Flores axilares, sesiles a pediceladas, los cinco tépalos unidos en la base; estambres 5, libres y con inserción alterna a los tépalos o numerosos insertos en forma continua en el tubo floral, mas pequeños que los tépalos, el filamento filiforme o subulado, las anteras pequeñas, comunmente amarillento-rojizas; estilos 2-5, lineares, erectos, el estigma longitudinal, papiloso; ovario semiífero, 2-5 lóculos, los óvulos numerosos, anacampilotropos, la placentación axilar. Cápsula membranosa, envuelta por el perianto, circuncísil cerca del centro; semillas numerosas, pequeñas, lustrosas y oscuras.

Género con cerca de ocho especies distribuidas en los trópicos y subtrópicos de ambos hemisferios (Bogle 1970; Correll & Correll 1972; Lot-Helgueras & Rico-Gray 1978). En la Península de Yucatán se presenta una especie (Sosa, *et al.* 1985).

Sesuvium portulacastrum L., *Syst. Nat.*, ed. 10. 1055. 1759.

Portulaca portulacastrum L., *Sp. Pl.* 446. 1753.

Sesuvium revolutifolium Ortega, *Hort. Matr.*, Dec. 19. 1797.

Sesuvium ortegae Spreng., *Nachr. Bot. Gart. Halle* 1:36. 1801.

Sesuvium pedunculatum Pers., *Syn. Pl.* 2:39. 1806.

Sesuvium sessile Pers., *Syn. Pl.* 2:39. 1806.

Sesuvium sessiliflorum Domb. ex Rohrb., en Martius *Fl. Bras.* 14, 2:310. 1872.

Halimus portulacastrum O. Kuntze, *Rev. Gen.* 1:263. 1891.

Nombre común: Ts'a'ay kaan, ts'in kaan, xaw tsikin, xukul, pico real, verdolaga xukul, verdolaga de costa, verdolaga de la playa.

Hierba perenne; tallo rastrero o erecto, muy ramificado, hasta 2 m de diámetro, de color verde-morado, liso, glabro. Hojas oblongas a oblongo-lanceoladas, suculentas, 0.7-5 cm de largo y 0.2-0.6 cm de ancho, lisas, el margen entero, el apice agudo-obtuso, sin nervación aparente, pecioladas. Flor pedicelada, el pedicelo de 0.6-1.5 cm de largo, la simetría radial; perianto pentalobulado, los tépalos ovado-lanceolados a lanceolados, persistentes, la superficie interna de color rosa-morada, ca 0.4-0.8 cm de largo y 0.2-0.3 cm de ancho; estambres numerosos, insertos en el tubo floral, perigineos, libres o subunidos, las anteras oblongo-elípticas, alrededor de 0.1 cm de largo, el filamento de 0.3 cm de largo; ovario 3 ó 4 carpelar, trilobular, ovoide-globoso, los óvulos numerosos, la placentación axilar; estilos 3 ó 4, ca 0.2 cm de largo, el estigma longitudinal, papiloso. Fruto capsular, conico, verde a moreno claro, 0.9-1.1 cm de largo y 0.5-0.6 cm de ancho; semillas ca 50, lenticular-reniformes, 1.2-1.5 mm de diámetro, el arilo membranoso, negras, lisas, lustrosas, el endospermo suave, albuminoso, el embrión anular, los cotiledones oblongos, carnosos.

Sesuvium portulacastrum se distribuye desde los Estados Unidos hasta Sudamérica a lo largo de las costas de los Océanos Atlántico y Pacífico. En México a lo largo de ambas costas e islas cercanas y en algunos lugares del interior (zonas secas o salinas). En la Península de Yucatán se distribuye a lo largo de toda la costa, siempre al nivel del mar, en manglares y vegetación de duna costera. Florece de febrero a noviembre, siendo mas intensa en el verano. La apariencia de esta especie es muy variable, dependiendo del medio donde se la encuentre. Generalmente se presenta mejor desarrollada en las dunas, los individuos en los manglares ocupan zonas extensas pero son pequeños en sus estructuras, v.g., largo de hojas, ancho del tallo. El verano es la época del año donde se presenta el máximo desarrollo de esta especie.

Ejemplares examinados.

Yucatán: Telchac Puerto, *Calzada, et al.* 6603 (XAL); Isla Blanca de Arrecife Alacranes, *Chan* 830 (XAL); entrada al puerto de Sisal, *Chan* 2837 (XAL); Río Lagartos junto al ojo de agua, *Chan y Puch* 1544 (XAL); 15 km de Celestún camino a Sisal, *Espejel* 47 (XAL); Isla Pérez en Arrecife Alacranes, *Flores y Ucan* 9231 (XAL); Isla Larga de Arrecife Alacranes, *Flores y Ucan* 9249 (XAL); Isla Muertos en Arrecife Alacranes, *Narvaez, et al.* 755 (XAL); Celestún, *Palma y Allkin* 281 (XAL); 6 km al W de Sisal, *Puch y Espejel* 582 (XAL); Río Lagartos a orilla del ojo de agua, *Puch y Chan* 808 (XAL); 800 m al S de Celestún orilla del estero, *Rico-Gray* 63 (XAL); 4 km al S de Sisal, *Rico-Gray* 76 (XAL); 1 km al S de Chelem, *Rico-Gray* 83 (XAL); 1.5 km al E de Dzilam de Bravo, *Rico-Gray* 92 (XAL); Río Lagartos, *Rico-Gray* 108 (XAL); Sisal, *Rico-Gray* 354 (XAL).

Campeche: entre Villa Madero y Seybaplaya, *Calzada, et al.* 6782; km 4 carr. Campeche-Champotón, *Chan y Burgos* 673 (XAL); Isla Centro de Arrecife Cayo Arcas, *Flores y Ucan* 9181 (XAL); camino a El Zapote cerca de Champotón, *Puch* 47; camino a El Zapote cerca de Champotón, *Rico-Gray* 139 (XAL); Isla Arena, *Rico-Gray* 225 (XAL); Isla del Centro de Cayo Arcas, *Zamudio* 100 (CSAT,XAL).

Quintana Roo: lado SE de Isla Mujeres, *Chan, et al.* 1568 (XAL); lado SE de Isla Contoy, *Chan, et al.* 1626 (XAL); lado N de Isla Holbox, *Chan, et al.* 1644 (XAL); parte S Isla Cozumel, *Chan, et al.* 1763 (XAL); Isla Mujeres, *Flores y Ucan* 8376 (XAL); Isla Contoy, *Flores y Ucan* 8845, 8861 (XAL); Isla Holbox en Cabo Catoche, *Flores, et al.* 9371 (XAL); parte E de Isla Mujeres, *Flores, et al.* 9271 (XAL); parte W de Isla Contoy, *Flores, et al.* 9334; islote norte de Cayo Culebras, *Flores, et al.* 9522 (XAL); playa Ojo de Agua en Pto. Morelos, *Moreno* 621 (MEXU); playa de Pta. Brava 4 km al S de Pto. Morelos, *Moreno* 844 (MEXU); Cayo Centro de Banco Chinchorro, *Narvaez y Ucan* 891 (XAL); Cayo Norte de Banco Chinchorro, *Narvaez y Ucan* 906 (XAL); lado W de Isla Mujeres, *Puch, et al.* 840 (XAL); lado E de Isla Contoy, *Puch, et al.* 903 (XAL); 4 km al W de Cabo Catoche, *Puch, et al.* 938 (XAL); Vigia Chico, *Rico-Gray* 134 (XAL); entre Pto. Juárez y Punta Sam, *Rico-Gray y Chan* 399 (XAL); parte N de Isla Holbox, *Rico-Gray* 175 (XAL); Playa Maya al S de Isla Cozumel, *Rico-Gray* 251 (XAL).

TRIANTHEMA L., *Sp. Pl.* 1:223. 1753.

Hierbas suculentas, erectas o postradas, ramificadas. Hojas opuestas, las del mismo par de distinto tamaño (una más grande que la otra), pecioladas, la base del peciolo envolvente. Flores pequeñas, sésiles, generalmente solitarias en las axilas de las hojas; perianto pentalobulado, cóncavo, la superficie interior de color rosa muy tenue; estambres 5-10, perigíneos, alternos a los sépalos cuando igual en número; ovario semi-ínfero, 1-2 lóculos, pocos óvulos; estilos 1-2. Fruto capsular, membranoso o coriáceo, con apéndices alados prominentes en

el ápice, carnosos, circuncísil longitudinalmente; semillas reniformes, el embrión anular, los cotiledones oblongos.

Se presentan alrededor de 15 especies en los trópicos o en regiones cálidas de ambos hemisferios (Nevling 1961). Sólo una especie se presenta en Norteamérica (Correll & Johnston 1970).

Trianthema portulacastrum L., *Sp. Pl.* 223. 1753.

Trianthema monugyna L., *Gen. Pl.* 105. 1754.

Trianthema monogynum L., *Mant.* 69. 1767. *Portulacastrum monogynum* (L.) Medic., *Phil. Bot.* 1:99. 1789.

Trianthema procumbens Mill., *Gard. Dict.*, ed. 8. No. I. 1768.

Trianthema flexuosa Schum. & Thorn., *Beskr. Guian. Pl.* 221. 1828.

Nombre común. Verdolaga.

Hierbas anuales, rastreras o erectas, formando carpetas hasta de 1 m; tallos muy ramificados, los jóvenes pubescentes. Hojas obovadas o suborbicular-elípticas, succulentas, 0.7-2.8 cm de largo y 0.3-1.3 cm de ancho, lisas, el margen entero, el ápice agudo a obtuso, la base cuneada rodeando al tallo, sólo la nervadura central aparente, ocasionalmente el borde de la hoja de color morado; peciolo de 0.3-0.7 cm de largo. Flores axilares, solitarias, la simetría radial; perianto pentalobulado, los lóbulos ovado-lanceolados a lanceolados, la superficie interior de color rosado (muy tenue), ca 0.25 cm de largo; estambres 5-10, insertos en el orificio del tubo del perianto, perigíneos, el filamento filiforme, ca 0.15 cm de largo, glabro, las anteras ovoideas, ca 0.05 cm de largo e igual de ancho; ovario unicarpelar, turbinado, de 0.01 cm de largo e igual de diámetro, glabro, uno o dos lóculos, pocos óvulos, placentación parietal, estilo de 0.01 cm de largo. Fruto capsular, cilíndrico, verde a moreno oscuro, 0.4-0.5 cm de largo; semillas 2-5, reniformes, ca 0.2 cm de diámetro, la testa rugosa, negra-rojiza, el endospermo albuminoso, el embrión anular, los cotiledones oblongos, carnosos.

Trianthema portulacastrum se distribuye desde el sur de Estados Unidos hasta Sudamérica. En México, en ambas costas y en algunos lugares del interior. Es una planta muy escasa en la península, solo ha sido colectada, entre el nivel del mar y los 20 m, en tres localidades del Estado de Yucatán, en manglares y como planta secundaria en basureros y en zonas arqueológicas. Florece todo el año.

Ejemplares examinados.

Yucatán: Chichen Itza, Gaumer 743 (MO); Izamal, Lundell & Lundell 8207 (MICH); Sisal, Rico-Gray 350 (XAL).

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BATACEAE DE LA PENÍNSULA DE YUCATÁN, MÉXICO

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RESUMEN

Se presenta la descripción de la familia Bataceae (=Batidaceae) para la Península de Yucatán, México (Estados de Yucatán, Campeche y Quintana Roo). Se describe taxonómicamente a *Batis maritima*; se presenta información sobre su distribución y ejemplares examinados.

ABSTRACT

A description of Bataceae (=Batidaceae) from the Yucatán Peninsula of México (states of Yucatán, Campeche and Quintana Roo) is presented. A taxonomic description of *Batis maritima*, information about its distribution and a list of specimens examined are presented.

PALABRAS CLAVE (KEY WORDS): Bataceae (=Batidaceae), *Batis maritima*, Yucatán, Campeche, Quintana Roo, México.

INTRODUCCIÓN

Los miembros de la familia Bataceae Meiss. (=Batidaceae) se caracterizan por ser arbustos o sufrutices, monoicos o dioicos, hasta de 1.5 m de altura, con tallos postrados o erectos, succulentos; hojas simples, opuestas, decusadas, sésiles, lineares a claviformes, succulentas, glabras, enteras; estípulas caducas, pequeñas; inflorescencias masculinas axilares o terminales, cónicas o espigadas con las flores en las axilas de brácteas; flores con 4 estambres alternisépalos, estos insertos en la base del perianto, los filamentos libres, engrosados o lineares y alados; inflorescencias femeninas axilares, con las flores sostenidas por brácteas y agregadas en conos; flores aperiantadas; ovario bicarpelar, sésil, 4-loculado, con un óvulo anátropo en la base de cada lóculo, el pericarpio esponjoso; semillas sin endospermo, la testa membranosa; embrión erecto, los cotiledones largos (Rico-Gray & Nee 1982).

Se sitúa el origen de la familia en el Cretácico Superior (Maestrichtiano) (Muller 1981). En el mundo esta familia está representada por un sólo género con dos especies: *Batis maritima* L. en las costas tropicales y subtropicales

del Nuevo Mundo y *B. argillicola* van Royen, en la costa sur de Nueva Guinea (Van Royen 1956). Las dos especies son muy similares, *B. argillicola* difiere principalmente en que es monoica con las flores sostenidas (envueltas) por hojas y no agregadas en conos (espigas cortas); también es muy similar en hábito a *B. maritima* y crece, así mismo, en regiones salinas cercanas al mar.

La situación filogenética del género *Batis* es un tanto incierta, por una parte ha sido asociado con el orden Caryophyllales (Subclase Caryophyllidae) por la apariencia y hábitos similares al género *Sarcobatus* (Chenopodiaceae) (Mabry & Turner 1964; McLaughlin 1959). En general, *Batis* tiene ciertas características que no están presentes en ese orden (Caryophyllales), como son: la ausencia de antocianinas y betalaninas, embrión recto en lugar de curvo, ovario tetralocular y un óvulo por lóculo. Morfológicamente se puede relacionar con los Hammamelidae aunque no está emparentado. La incertidumbre en la ubicación filogenética de las Batales, también la comparten otros autores (Kagan & Mabry 1969), quienes indican que fitoquímicamente sus afinidades son muy oscuras como las de Caryophyllaceae y Molluginaceae. Varias líneas de evidencia indican que la familia puede estar relacionada al orden Capparales. Con este comparte la presencia de mirosinasa (Schraudolf, *et al.* 1971) y también existe evidencia a favor por el número de cromosomas (Goldblatt 1976).

BATIS L., *Syst. Nat.*, ed. 10. 1289, 1380. 1759.

Con los mismos caracteres de la familia.

Batis maritima L., *Syst. Nat.*, ed. 10. 1289, 1380. 1759.

Nombre común: Alambrillo, saladillo.

Arbustos o sufrutices, generalmente muy ramificados, hasta de 60 cm de altura; tallos erectos, los más viejos postrados, teretes, hasta de ca 6 mm de diámetro, los jóvenes amarillo-verdosos, verde pálidos al secarse, succulentos, glabros. Hojas de 0.5-4 cm de largo por 0.5-1 cm de ancho cuando secas, succulentas, glabras, el ápice agudo o diminutamente apiculado, la base prolongada más allá del punto de inserción en el tallo para formar un lóbulo, este redondeado a agudo o ligeramente trilobado, de ca 1 mm de largo, recurvado al secar. Inflorescencias masculinas axilares, en forma de espiga, sésiles a subpedunculadas, de 5-10 mm de largo por 3-4 mm de ancho; brácteas en igual número que las flores, en 4 filas, imbricadas, persistentes, de ca 2 mm de largo y de ancho, obtusas a apiculadas; flores 12-32; cáliz en forma de copa, bilobado; corola ausente; estambres 4, insertos en la base del cáliz, los filamentos de ca 1.5 mm de largo, aplanados cuando secos, alternos y más largos que los estaminodios triangulares, las anteras de 0.8-1.2 mm de largo, dorsifijos. Espigas femeninas con 4-12 flores; sin cáliz ni corola, pero sostenidas por pequeñas brácteas deciduas, suborbiculares, ca 2 mm de ancho, apiculadas;

pistilos unidos en la mitad inferior para formar un conjunto, de ca 6 mm de largo por 2.5 mm de grueso, papilado-puberulentos, el ápice libre, ahusado y dirigido hacia la espiga, los estigmas bilobados, sésiles. Fruto más o menos ovoide, irregular, con los estigmas persistentes, de 5-15 mm de largo por 5 mm de grueso.

Batis maritima se distribuye en ambas costas del Continente Americano, desde California hasta Perú en el oeste y desde Florida hasta Brasil en el este (Burger 1977; Correll & Correll 1975; Correll & Johnston 1970; Mason 1957; Shreve & Wiggins 1964; Standley 1930). Es común en la mayoría de las Islas del Caribe. Ha sido introducida en las Islas Hawaii. En México se presenta a lo largo de los dos litorales, generalmente asociada a manglares. En la Península de Yucatán se presenta a lo largo de la costa de los tres estados, asociada a manglares; en general terrenos que son inundados por agua salina durante una época del año y que al secarse dejan suelos con altas concentraciones salinas. El hábito de la planta es muy variable dependiendo de las condiciones de salinidad y nivel de agua del suelo; podemos encontrar plantas totalmente postradas y otras erectas. Florece de marzo a septiembre.

Ejemplares examinados.

Yucatán: Progreso, *Bruff 1473* (MEXU); 2 km al W de Sisal, *Chan y Rico-Gray 1546* (XAL); camino El Cuyo-Colonia Yucatán, *Narvaez 26* (XAL); carr. Telchac Puerto-Chicxulub Pto., *Narvaez y Espejel 644* (XAL); Sta. Clara-Dzilam de Bravo, *Palma y Allkin 307* (XAL); orilla del ojo de agua en Río Lagartos, *Puch y Chan 812* (XAL); 800 m de Celestún a orilla del estero, *Rico-Gray 70* (XAL); 1 km al S de Chelem, *Rico-Gray 82* (XAL); 1.5 km al E de Dzilam de Bravo, *Rico-Gray 97* (XAL); Río Lagartos, *Rico-Gray 105* (XAL); 3 kms al S de El Cuyo, *Rico-Gray 111* (XAL).

Campeche: carr. Villahermosa-El Zacatal, *Bonilla 46* (ENCB); Punta Arenas, *Chan 416* (XAL); El Remate, *Chan y Burgos 662* (XAL); Punta Arena, *Chan y Flores 416* (XAL); Pto. Real a Cd. del Carmen, *Chan y Flores 509* (XAL); El Zacatal, *Chavelas y Zamora ES-4753* (MEXU); isla del centro en Arrecife Cayo Arcas, *Flores y Ucan 9187* (XAL); 6 km antes de la costa en camino Pomuch-Isla Jaina, *Gongora 558* (XAL); 1 km antes del puente de Sabancuy, *Gongora 577* (XAL); Cd. del Carmen, *Miranda 7946* (MEXU); camino a El Zapote cerca de Champotón, *Puch 46* (XAL).

Quintana Roo: 2 km antes del Mirador Maya en Isla Mujeres, *Chan, et al. 1591* (XAL); Isla Contoy, *Chan, et al. 1634* (XAL); Holbox, *Flores 8497* (XAL); parte E de Isla Mujeres, *Flores y Ucan 8403* (XAL); Isla Mujeres, *Flores y Ucan 8424, 8811* (XAL); Holbox, *Flores y Ucan 8497* (XAL); Cayo Centro en Banco Chinchorro, *Flores y Ucan 8965, 8973* (XAL); Isla Mujeres, *Flores, et al. 9299* (XAL); Isla Contoy, *Flores, et al. 9344* (XAL); Cayo Culebras, *Flores, et al. 9511* (XAL); Cayo Centro en Banco Chinchorro, *Narvaez*

809 (XAL); lado E de Isla Contoy, *Puch, et al.* 912 (XAL); Vigia Chico, *Rico-Gray* 135 (XAL); Holbox, *Rico-Gray* 203 (XAL); Chiquilá, *Ucan* 430 (XAL); Cayo Norte en el Banco Chinchorro, *Ucan* 2099 (XAL); atrás del Puerto de Abrigo de Isla Mujeres, *Ucan y Flores* 1040, 1050, 1051 (XAL); Isla Mujeres, *Ucan y Flores* 1079 (XAL); ruinas de La Mundaca en Isla Mujeres, *Ucan y Flores* 1239 (XAL).

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RHIZOPHORACEAE DE LA PENÍNSULA DE YUCATÁN, MÉXICO

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RESUMEN

Se presenta la descripción de la familia Rhizophoraceae para la Península de Yucatán, México (Estados de Yucatán, Campeche y Quintana Roo). Se describe taxonómicamente a *Cassipourea guianensis* y a *Rhizophora mangle*; se presenta información sobre su distribución y ejemplares examinados.

ABSTRACT

A description of Rhizophoraceae from the Yucatán Peninsula of México (states of Yucatán, Campeche and Quintana Roo) is presented. Taxonomic descriptions of *Cassipourea guianensis* and *Rhizophora mangle*, along with information about their distribution and a list of specimens examined are presented.

PALABRAS CLAVE(KEY WORDS): Rhizophoraceae, *Cassipourea guianensis*, *Rhizophora mangle*, Yucatán, Campeche, Quintana Roo, México.

INTRODUCCIÓN

Los miembros de la familia Rhizophoraceae R. Brown se caracterizan por ser árboles o arbustos perennifolios, con hojas por lo común opuestas, estípulas amplias, interpeciolares y caducas; inflorescencias generalmente axilares con flores perfectas, el cáliz persistente, los pétalos libres después de la antesis, alternisépalos, en número doble o igual a aquellos, los estambres libres, el ovario generalmente ínfero, algunas veces semi-ínfero o súpero, los óvulos 4-muchos, anátropos; fruto una baya o cápsula; germinación a veces vivípara (Gregory 1958; Vázquez-Yanes 1980).

El origen de esta familia se sitúa en el Eoceno Superior. Algunos autores consideran que el centro de origen se localiza en el sureste asiático (Chapman 1975; Steenis 1962) y, otros, proponen al antiguo continente de Gondwana como el lugar de origen de un grupo de géneros de la familia (Raven & Axelrod

1974). Es muy probable que futuras investigaciones indiquen que la segunda idea sea la mas acertada, ya que algunos de los restos fosiles mas antiguos del género *Rhizophora* provienen de zonas que antiguamente formaron parte de Gondwana (v.g., India).

En América se presentan 3 géneros de esta familia, los cuales por las diferencias que presentan en el hábitat y forma de dispersión los podemos separar en dos grupos. Por un lado tenemos a *Rhizophora*, su dispersión es por medio de corrientes marinas y habita zonas costeras y, por otro lado, tenemos a los géneros *Anisophylla* y *Cassipourea* cuya dispersión se realiza en tierra y habitan bosques tropicales desde el nivel del mar hasta los 2000 msnm. La presencia de los dos últimos géneros en América se debe a que este continente formaba parte de Gondwana y al separarse este, las partes conservaron gran cantidad de los taxa presentes, lo que se evidencia con la presencia de estos dos géneros en Sudamérica y Africa. Con respecto al género *Rhizophora*, se piensa que llegó a América a través del antiguo Mar de Tetis (Chapman 1975).

La familia Rhizophoraceae es bastante conocida pues contiene a las especies de mangles mas conspicuas. Está constituida por 16 géneros y 120 especies, la última cifra puede variar dependiendo del autor. Se distribuye en las regiones tropicales y subtropicales del mundo, generalmente entre los 25° N y 25° S de latitud. El género con la más amplia distribución es *Rhizophora*. En México se presentan los géneros *Cassipourea* y *Rhizophora* (Standley 1930; Standley & Williams 1963).

CLAVE PARA GÉNEROS DE RHIZOPHORACEAE DE YUCATÁN

Clave para los géneros de la familia Rhizophoraceae presentes en la Península de Yucatán:

1. Plantas con raíces subterráneas; hojas subcoriáceas; 15-20 estambres; fruto una cápsula carnosa *Cassipourea*
- 1' Plantas con raíces adventicias aéreas y raíces "zanco;" hojas coriáceas; estambres 8; fruto una baya de la que pende frecuentemente el hipocótilo del embrión desarrollado *Rhizophora*

CASSIPOUREA Aubl., *Hist. Pl. Guian. Fr.* 1:528. 1775.

Tita Scop., *Introd.* 219. 1777.

Legnotis Swartz, *Prod.* 84. 1788.

Richaëia Thouars, *Gen. Nov. Madag.* 25. 1806.

Weihea Spreng., *Syst.* 2:594. 1825.

Austrutheria Gardn., *Calcutta J. Nat. Hist.* 6:344. 1846.

Dactylopetalum Benth., *J. Linn. Soc., Bot.* 3:79. 1858.

Richea O. Kuntze, Rev. Gen. 235. 1891.

Arboles o arbustos más o menos glabros. Hojas opuestas, subcoriáceas o membranosas, el margen entero a crenado o dentado; estípulas interpeciolares pequeñas, caducas. Flores en las axilas de las hojas, perfectas, solitarias a fasciculadas, pedunculadas o subsésiles; cáliz coriáceo, 4-7 lóbulos triangulares, erectos; corona con 4-7 pétalos blanco-cremosos, alternisépalos, insertados en la base de un disco cupular crenado, glabros o pubescentes, caducos; estambres 8-40, los filamentos iguales o mas largos que el cáliz; ovario súpero, 2-4 locular, 2 óvulos por lóculo. Fruto una cápsula carnosa, coriacea; 2-4 semillas ariladas.

Este género consta de 60 especies, la mayoría se encuentran en Centro, Sudamérica y Africa; también se encuentra en Madagascar, India, Sri Lanka y Australia. En México sólo existe *Cassipourea guianensis* (Vázquez-Yanes 1980).

Cassipourea guianensis Aubl., *Hist. Pl. Guian. Fr.* 1:529. 1775.

Legnotis elliptica Sw., *Prodr.* 84. 1788. *Cassipourea elliptica* Poir., *Encycl.*, suppl. 2, 131. 1811.

Cassipourea podantha Standl., *Field Mus. Nat. Hist., Bot. Ser.* 4:241. 1929.

Cassipourea macrodonta Standl., l.c. 242.

Cassipourea belizensis Lundell, *Bull. Torrey Bot. Club* 66:598. 1939.

Nombre común: Nanchillo negro (Tabasco), waterwood (Belice).

Arbol o arbusto perennifolio; corteza gris o pardo-grisacea, inumento amarillo claro. Hojas ovadas a elípticas de 2.5-12 cm de largo y 1.4-4.5 cm de ancho, membranaceas, margen entero o dentado ligeramente, ápice agudo, base obtusa; peciolo hasta 0.6 cm de largo; nervadura central bien perceptible en el envés de la hoja; estípulas interpeciolares caducas; yema terminal de 0.2-0.4 cm de largo. Flores axilares, fasciculadas o generalmente geminadas, con 2 ó 3 flores, pedicelos articulados de 0.2-0.5 cm de largo, hermafroditas, 0.7-0.9 cm de diámetro; cáliz pentalobulado, persistente, de 0.3-0.4 cm de longitud, coriáceo, glabro; corola con 5 pétalos caducos, blanco-amarillentos, los márgenes con vellosidades, laciniados, de 0.5-1.0 cm de largo y 0.4-0.6 cm de ancho; estambres 15-20, blancos, hasta de 0.2 cm de longitud; ovario trilocular, estilo filamentosos de 0.2-0.4 cm de longitud, persistente. Fruto, una cápsula de color moreno al madurar, redondeada a ligeramente elíptica, de 0.5-1.1 cm de longitud y 0.3-0.7 cm de diámetro.

Cassipourea guianensis habita en las regiones húmedas de Centroamérica y sureste de México. Se encuentra también en las Islas del Caribe y norte de Sudamérica hasta Brasil y Perú. Para México se tienen registros para el límite entre los estados de Chiapas y Tabasco, el sur de Veracruz y la Península

de Yucatán. En la península sólo se le encuentra al nivel del mar, hasta unos kilómetros al norte del Río Hondo en el Estado de Quintana Roo, en áreas pantanosas formando el sotobosque de una comunidad de *Pinus caribaea*. Florece entre abril y noviembre.

Ejemplares examinados.

Quintana Roo: sabana del Jaguacatal ejido de Caobas, *Calzada 10535* (XAL); ejido de Caobas, *Flores 10194* (XAL); El Jaguacatal ejido de Caobas, *Flores y Puch 9064* (XAL).

RHIZOPHORA L., *Gen. Pl.*, ed. 1. 137. 1737.

Mangle Pluk. ex Adans., *Fam. Pl.* 2:445. 1763.

Manguim Rumph. ex Scop., *Intr. Hist. Nat.* 218. 1777.

Asophora Neck., *Elem. Bot.* 2:361. 1970.

Arboles o arbustos monoicos; tronco y ramas apoyados en raíces adventicias. Hojas simples, pecioladas, glabras, coriáceas, margen entero; estípulas interpeciolares, sésiles, lanceoladas, foliosas, recubriendo a las hojas jóvenes antes de la expansión, luego caducas. Inflorescencias axilares, cimosas; pedúnculos dicotómicamente ramificados; flores 2-20 ó más por inflorescencia, perfectas; sépalos 4, libres, persistentes, coriáceos, glabros; pétalos 4, alternisépalos, libres, caducos, coriáceos o membranosos, cubiertos por pelos simples; estambres 8 ó 12, las anteras subsésiles, multiloculares; ovario semi-infero, cada lóculo con 2 óvulos anátropos suspendidos del ápice. Fruto una baya coriácea; una semilla con el embrión vivíparo.

El género presenta 3 especies en el continente americano, de las cuales sólo *Rhizophora mangle* se encuentra en la Península de Yucatán (Breteler 1969; 1977; Rico-Gray 1981).

Rhizophora mangle L., *Sp. Pl.* 1:443. 1753.

Rhizophora americana Nutt., *N. Amer. Sylv.* 1. 1842.

Rhizophora mangle var. *samoensis* Hochr., *Cand.* 2. 1925. *Rhizophora samoensis* (Hochr.) Salvoza., *Nat. Appl. Sci. Bull. Univ. Philipp.* 5:179-237.

Nombre común: Taab che', taap che', xtaab che', mangle colorado, mangle rojo.

Arbol perennifolio, hasta de 15 m; tronco hasta de 30 cm de diámetro (d.a.p.); corteza pardo-rojiza, gruesa, fisurada, inodora, amarga; indumento de color rojo intenso; tronco y frecuentemente las ramas apoyados en numerosas raíces aéreas de origen adventicio, simples o dicotómicamente ramificadas, con

numerosas lenticelas. Hojas decusadas, simples, pecioladas, elípticas a oblongas, de 5.5-11.7 cm de largo y 2.4-5.8 cm de ancho, coriáceas, lisas, gruesas, el haz glabro, verde intenso, brillante, el envés glabro, verde claro o amarillento, con puntuaciones pardas, el margen entero, el ápice agudo, la base obtusa; nervaduras poco perceptibles en la superficie de la hoja; estípulas interpeciolares, caducas, caen al extenderse la hoja, foliosas, sésiles, convolutas, con una doble hilera de escamas glandulares en la base interna produciendo un líquido viscoso, las cicatrices foliares persistiendo por 2 años; peciolo de 1.6-2.7 cm de largo; yema terminal de hasta 5.5 cm de largo, cubierta por las estípulas, de crecimiento continuo, las yemas laterales pequeñas. Inflorescencias simples, cimosas o geminadas, con 2 ó 3 flores; pedúnculos de 2.2-4 cm de largo; pedicelos de 0.4-1.7 cm de largo; flores hermafroditas de 2-2.5 cm de diámetro; sépalos 4, persistentes, amarillos, de 9-19 mm de largo por 4-5 mm de ancho, coriáceos, glabros, gruesos; pétalos 4, de ca 1 cm de largo por ca 2 mm de ancho, alternisépalos, caducos, blancos o amarillentos, lanceolados, involutos, el margen densamente veloso; estambres 8, subsésiles, multiloculados, de ca 6 mm de largo; estilo bifido de ca 5 mm de largo. Fruto una baya de color pardo, coriácea, dura, piriforme, farinosa, de 1.5-3.5 cm de largo por 0.8-1.9 cm de ancho en la base, cáliz persistente; semilla una, rara vez dos, el embrión sin latencia, creciendo en el fruto hasta perforarlo por el ápice y emergiendo al exterior, el hipocótilo creciendo unido al fruto, desprendiéndose cuando alcanza de 10-31 cm de largo, el endospermo transformándose en un órgano placentario que permite el intercambio entre el embrión en desarrollo y la planta, los cotiledones fusionados formando un tubo verde recubriendo a la plúmula hasta el desprendimiento del embrión, los cotiledones permaneciendo unidos al fruto; el hipocótilo alcanza al desprenderse hasta 31 cm de largo, pardo en la parte inferior y verde en la superior, con numerosas lenticelas, plúmula de hasta 1 cm.

Rhizophora mangle habita esteros, bahías, desembocadura de ríos, lagunas costeras de las costas de América, en forma continua. En el Océano Pacífico, desde el sur de Sonora y Baja California hasta Ecuador, incluyendo el Archipiélago de las Galápagos, se le encuentra también en algunas islas de los Archipiélagos de Polinesia y Melanesia y ha sido introducido a Hawái y, en al Océano Atlántico, se le encuentra en forma discontinua desde la Florida a Brasil, en las Islas del Caribe y en la costa oeste de Africa (Breteler 1969, 1977; Gill & Tomlinson 1969; Graham 1964; Rico-Gray 1981). En la Península de Yucatán se encuentra presente a lo largo de la costa de los tres estados que la componen, ocupando extensas zonas en los manglares y petenes de los estados de Campeche y Quintana Roo. Florece todo el año, siendo más intensa la floración entre abril y julio.

Ejemplares examinados.

Yucatán: Laguna Rosada 1 km antes de llegar a Telchac, *Calzada, et al.*

6613 (XAL); Isla Pérez de Arrecife Alacranes, *Flores y Ucan* 9235 (XAL); puente en el camino Río Lagartos-Las Coloradas, *Leal y Rico-Gray* 131 (XAL); camino Sisal-Celestún, *Narvaez y Puch* 808 (XAL); Río Lagartos, *Ordoñez* 361 (XAL); 7 km de Celestún hacia Kinchil, *Rico-Gray* 62 (XAL); 5 km de Celestún a Kinchil, *Rico-Gray* 71 (XAL); 4 km al S de Sisal, *Rico-Gray* 77 (XAL); 1.5 km al S de Chelem, *Rico-Gray* 88 (XAL); 2.5 km al E de Dzilam de Bravo, *Rico-Gray* 98 (XAL); 1 km al S de San Felipe, *Rico-Gray* 109 (XAL); cerca de Telchac Pto. en carr. a Motul, *Rico-Gray* 368 (XAL).

Campeche: zona de los petenes, mpio. de Calkiní, *Chan* 272 (XAL); Isla Punta Arena, *Chan* 1934 (XAL); Isla Punta Arena, *Chan y Flores* 426 (XAL); orilla del Río Zapote, *Chan y Yam* 1535 (XAL); camino El Remate-Punta Arena, *Narvaez y Rico-Gray* 247 (XAL); camino a El Zapote, *Rico-Gray* 140 (XAL); Playa Azul entre Champotón y Sabancuy, *Rico-Gray* 146 (XAL); camino El Remate-Isla Arena, *Rico-Gray* 217 (XAL); orilla del Río Zapote, *Yam* 224 (XAL).

Quintana Roo: Boulevard Bahía en Chetumal, *Calzada, et al.* 7035 (XAL); 4 km de Xcalak en carr. a Majahual, *Calzada, et al.* 7154 (XAL); Laguna Guerrero, *Chan y Burgos* 1436 (XAL); lado SE de Isla Mujeres, *Chan, et al.* 1566, 1619 (XAL); km 38 camino Tulum-Pta. Allen, *Duran y Gutierrez* 48 (CIQRO,XAL); Juan Sarabia al margen del Río Hondo, *Flores y Ucan* 8237 (XAL); a 5 km de Carrillo Puerto, *Flores y Ucan* 8333 (XAL); Laguna de Chunyaxché, *Flores y Ucan* 8350 (XAL); orilla de puerto de abrigo en Isla Mujeres, *Flores y Ucan* 8419 (XAL); Isla Holbox, *Flores y Ucan* 8476 (XAL); Isla Mujeres, *Flores y Ucan* 8804 (XAL); Cayo Centro en Banco Chinchorro, *Flores y Ucan* 8970 (XAL); Islote Cayo Centro en Banco Chinchorro, *Flores, et al.* 8958 (XAL); Isla Contoy, *Flores, et al.* 9270, 9327 (XAL); Isla Holbox, *Flores, et al.* 9366 (XAL); Cayo Culebras islote N, *Flores, et al.* 9502 (XAL); Cayo Centro en Banco Chinchorro, *Narvaez y Ucan* 880 (XAL); Cayo Norte de Banco Chinchorro, *Narvaez y Ucan* 904 (XAL); lado E de Isla Contoy, *Puch, et al.* 896 (XAL); 4 km al W de Cabo Catoche, *Puch, et al.* 934 (XAL); entre Pto. Juárez y Cancún, *Rico-Gray* 119 (XAL); cerca de zona arqueológica de Tulum, *Rico-Gray* 129 (XAL); Vigía Chico, *Rico-Gray* 132 (XAL); NE de Isla Holbox, *Rico-Gray* 207 (XAL); Banco Chinchorro, *Ucan* 2089 (XAL); Isla Mujeres, *Ucan y Flores* 1235 (XAL); Cayo Centro del Banco Chinchorro, *Ucan y Flores* 1320 (XAL); Cayo Centro en Banco Chinchorro, *Ucan y Narvaez* 2058 (XAL); camino Xcalak a Majahual, *Ucan, et al.* 640 (XAL); orilla Río Hondo, *Ucan, et al.* 913 (XAL).

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A NEW SPECIES OF *MICONIA* (MELASTOMATACEAE) FROM
DOMINICA, LESSER ANTILLES

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ABSTRACT

Miconia mornicola is described from Dominica.

KEY WORDS: Melastomataceae, *Miconia*, Lesser Antilles, systematics.

During preparation of Melastomataceae for D.H. Nicolson's *Flora of Dominica, Part 2, Dicotyledones* (in press), a new taxon was detected. Publication was delayed for lack of flowering material and the inability to determine whether the species was dioecious, as expected, or if the flowers were bisexual as they are in the most recent collections.

Miconia mornicola A.C. Nicolson, *sp. nov.*

A *Miconia globuliflora* (L. Richard) Cogniaux foliis obtuse caudiculatis, floribus bisexualibus et seminibus majoribus, laevibus differt. HOLOTYPE: DOMINICA: Morne Diablotins, "elfin woodland on ridge dominated by *Clusia*, alt. 4,500 ft, shrub 2.5 m. Calyx [hypanthium] purple. Petals white, reflexed, soon falling. Stamens splayed; filaments white, anthers cream; dark ring around white ovary. Leaf mid-green, glossy." 2 Dec 1988, A. Lack, M. Purkins & A. Taylor 1 (BM); Isotype: US-3145481.

Dense tree to 3 m; young leaves and branches sparsely rusty-scurfy; leaves 5 veined, glabrous, coriaceous, gland dotted beneath, margins dentate with incurved teeth, broadly elliptic, abruptly bluntly caudate, base obtuse-acute, 3.5-5 x 2.5-3 cm; petiole 1-1.5 cm; inflorescence pyramidal-paniculate, to 7 cm; flowers pentamerous, pedicels 1 mm; hypanthium 1.4 mm, rosy purple, darker within; calyx white, ca 1 mm, tube 0.4 mm, sepals triangular, 0.6 mm, persistent; petals white, round, strongly reflexed, fugacious, 1.7 x 2 mm; stamens 10, 3.5 mm long, broadly spreading at anthesis, filaments 2 mm long, anthers to 1.5 mm, cream, connective with a blunt, basal, bilobed, dorsal tooth to 0.5 mm long and a lobed ventral appendage to 0.2 mm; style exerted before

petals open, to 4 mm long, glabrous, stigma scarcely expanded, ovary white, trilocular, 1/3 inferior; fruits globular, bluish. 3 mm; seeds 15-20, smooth, 1.1 x 0.6 mm.

Known only in dwarf forests of Dominican mountain tops: Morne Anglais (*Nicolson 4106*), Morne Diablotins (*Chambers 2643; Lack, et al. 2*), Morne Trois Pitons (*Ernst 1116A, 2041; Hodge 1420*). Flowering early December, fruiting late January (*Chambers, Nicolson*).

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I am grateful to Caroline Whitefoord (BM) who encouraged the collectors, whom I also thank, to search for flowering material. The collectors were Dr. Andrew Lack (Ecology lecturer, Oxford Polytechnic, Oxford, U.K.) and two recent graduates (University of East Anglia, Norwich, U.K.), Melanie Purkins and Andrew Taylor.

TWO NEW SPECIES OF *ARCHIBACCHARIS* (ASTERACEAE: ASTEREEAE)
FROM OAXACA, MÉXICO

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ABSTRACT

Two new species of *Archibaccharis* sect. *Archibaccharis* from south central Oaxaca, México are described: *A. macdonaldii* and *A. nephopcephala*.

KEY WORDS: *Archibaccharis*, Asteraceae, Astereae, México.

Recent collections from south central Oaxaca by Dr. Andrew McDonald include a number of previously undescribed species, among them two species of *Archibaccharis*. Both are erect shrubs and members of sect. *Archibaccharis*, but they are only distantly related to each other within that section. Both are known only from the type collection.

Archibaccharis macdonaldii Nesom, *sp. nov.* TYPE: MÉXICO. Oaxaca: Cerro Quiexobra and vicinity, 35 km ESE of Miahuatlán, 5 km NE of Santo Domingo Ozolotepec, timberline vegetation in open glades along ridges and in mountain saddles, dominated below by pine forest, common on dry, ridge tops, SE exposure, 3650-3800 m, 10 Dec 1989, *A. McDonald 2932* (HOLOTYPE: TEX; isotypes: F, MEXU, NY).

A. hieracioides (S.F. Blake) S.F. Blake similis sed foliis multo minoribus paucidentatis, capitulis minoribus, et corollis pistillatis ligulis brevibus differt.

Woody, erect shrubs. Stems 1-2 m tall, the upper highly branched and dark purple-brown. Stems, leaves, and phyllaries moderately to densely invested with short stipitate resin glands, the stems also sparsely villous. Leaves densely arranged, obovate, basally attenuate to a subpetiolar base, not clasping, 6-16 mm long, 3-7 mm wide, with 1-3 pairs of coarse teeth, thick textured with the upper surface somewhat shiny, glandular but otherwise glabrous or with a few, scattered hairs. Heads campanulate-turbinate, 3-4 mm wide, on wiry pedicels 7-15 mm long, in distinctly flat topped corymbs; phyllaries oblong-lanceolate, purple tipped, graduated, the inner 4.0-4.5 mm long, with

hyaline, lacerate-ciliate margins; receptacles deeply alveolate. Pistillate heads: pistillate flowers 28-29, with ligules 0.2-0.3 mm long; hermaphroditic flowers 4, with sterile ovaries; achenes 1.2-1.4 mm long, flat, with 2 thick, lateral ribs, eglandular, sparsely strigose; pappus bristles 40-45, somewhat uneven in length, the longest 4-5 mm long. Staminate heads not seen.

Archibaccharis macdonaldii is closely related to *A. hieracioides* and *A. auriculata* (Hemsley) Nesom (see Nesom 1988) but most similar to the former in its non-clasping, sub-petiolar leaves. With both of the other taxa, the new species shares an erect habit, stipitate glandular vestiture, and relatively large, thin pedicellate heads in an open, distinctly flat topped, corymbose capitulescence. In contrast to both relatives, *A. macdonaldii* has a woodier habit, thicker, much smaller and coarsely toothed leaves, and smaller heads with ligulate pistillate corollas, as specified in the following couplet.

1. Leaves 4-18 cm long, 20-45 cm wide, with 5-13 shallow, apiculate teeth per side; inner phyllaries 5.0-6.5 mm long; pistillate corollas
 eligulate *A. hieracioides*
- 1' Leaves 0.6-1.5 cm long, 3-7 mm wide, with 1-3 coarse teeth per side; inner
 phyllaries 4.0-4.5 mm long; pistillate corollas with ligules 0.2-0.3 mm
 long *A. macdonaldii*

The only other species of the genus with such extreme woodiness and small, thick leaves is the isolated *Archibaccharis peninsularis* S.F. Blake from Baja California Sur. Because both *A. hieracioides* and *A. auriculata* occur at lower elevations, are more herbaceous, and have much larger and thinner leaves than *A. macdonaldii*, and because they are similar in these respects to the rest of the genus, I hypothesize that the morphology of the new species is evolutionarily derived with respect to its closest relatives. It is not clear, however, whether it is the sister taxon of *A. hieracioides* or of both *A. hieracioides* and *A. auriculata*.

Archibaccharis nephocephala Nesom, *sp. nov.* TYPE: MÉXICO. Oaxaca: Dirt road between La Cienegilla and San Gregorio Ozolotepec, ca 5 km N of La Cienegilla, roadside weed, pine forest or cloud forest dominated by *Clethra*, *Pinus* and *Quercus*, ca 2500-3000 m, 12 Dec 1989, A. McDonald 2971 (HOLOTYPE: TEX; Isotypes: F, MEXU, NY).

A. serratifoliae (Kunth) S.F. Blake similis sed foliis petiolis longioribus laminis longioribus apicibus acuminatioribus et capitulis paucioribus confertim dispositis differt.

Erect shrubs. Stems 2.5 m tall, slightly zig zag in the capitulescence, eglandular, pilose-villous, the hairs with thick and viscid bases. Leaves ovate

with long acuminate apices and serrulate-apiculate margins, the blades thin, 9-12 cm long, 3-4 cm wide, basally attenuate to narrow petioles 15-25 mm long, the lower surfaces moderately villous with thin based, crinkly, whitish vitreous hairs, the upper surfaces moderately hispid-pilose with stiffer hairs with thick and orangish bases. Heads cuneate, 3 mm wide, in dense, subcorymboid to rounded panicles; phyllaries lanceolate, graduated, the longest 1.5-2.0 mm long, with thinly pilose-ciliate upper margins, otherwise glabrous or with a few, scattered hairs. Pistillate heads: pistillate flowers 19-20, with ligules 0.4-0.5 mm long; hermaphroditic flowers 1, with sterile ovaries; achenes 1.0-1.2 mm long, flat, with 2(-4) thick, lateral ribs, eglandular, sparsely strigose to glabrous; pappus bristles 14-16, 1.6-2.0 mm long. Staminate heads: staminate flowers 20-21, the corollas 2.0-2.2 mm long, with abortive ovaries.

The epithet refers to the cumulus shaped capitulescences as well as the cloud forest habitat of the new species.

Archibaccharis nephcephala is most similar, and perhaps most closely related, to the much more widespread *A. serratifolia* (Jackson 1975) in its erect habit, eglandular but densely pilose to villous vestiture and ovate-acuminate leaves. The new species differs strongly in its much longer acuminate leaves with longer petioles and in its much smaller and more densely arranged heads with smaller corollas. Technically, they can be separated by the following couplet.

- | | |
|---|------------------------|
| 1. Petioles 1-10(-15) mm long; phyllaries 4-5 mm long; staminate corollas 3.9-5.0 mm long | <i>A. serratifolia</i> |
| 1' Petioles 15-25 mm long; phyllaries 1.5-2.0 mm long; staminate corollas 2.0-2.2 mm long | <i>A. nephcephala</i> |

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SYNOPSIS OF *OLDENLANDIA* (RUBIACEAE) IN THE UNITED STATES

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ABSTRACT

A synoptic taxonomic treatment for *Oldenlandia* (Rubiaceae) is provided for five species occurring in the United States, including data on generic differences, keys to species, synonyms, brief descriptions, and habitats and distributions. Two of the species, *O. boscii* and *O. uniflora*, are native, and three species, *O. corymbosa*, *O. salzmännii* and *O. callitrichoides*, are adventive.

KEY WORDS: *Oldenlandia*, Rubiaceae, systematics, United States.

This synopsis provides a generic description of *Oldenlandia*, data on generic differences, keys to species, synonyms, brief descriptions, and habitats and distributions. These data are intended to provide a body of useful taxonomic information for this genus pending completion of a more detailed taxonomic treatment. Five species of *Oldenlandia* are included, of which two are native to the United States and three are adventive.

Oldenlandia (tribe Hedyotideae; Rubiaceae) is a worldwide genus of warm, subtropical and tropical regions. Verdcourt (1976: 269) estimated the genus to have nearer 100 species, instead of the 300 sometimes estimated (e.g., Willis 1973). Most of the species are native to Africa, with smaller numbers in Asia, Australia and the Americas. Bremekamp (1952) in his extensive monograph of African species of *Oldenlandia* treated 61 species arranged in 16 subgenera and also dealt with 19 other genera more or less closely related to *Oldenlandia*. Authors of recent African floras recognized 12 *Oldenlandia* species in West Tropical Africa (Hepper & Keay 1963), 7 species in Gabon (Hallé 1966) and 37 species in Tropical East Africa (Verdcourt 1976). These authors did not recognize the occurrence of *Hedyotis* species in their regions, and Hallé (1966) commented that *Hedyotis* is an Asian genus.

Since 1753, the closely related Linnaean genera *Hedyotis*, *Houstonia* and *Oldenlandia*, have been subjected to the shifting opinions of many systematic botanists; some of this literature was reviewed by Fosberg (1943) and Bremekamp (1952). Verdcourt (1976: 269), while treating *Oldenlandia*, cited recent literature on these genera, including papers by Fosberg (e.g. 1943) and

Lewis (1961) that favored the union of these genera under *Hedyotis*. Later however, Lewis (1964, 1965, 1966b) recognized *Oldenlandia* as a distinct genus, while providing chromosome and pollen data. Verdcourt (1976: 269) commented that "If all the genera closely related to *Hedyotis* are sunk into it, then it forms an unwieldy unit covering a very wide range of structure and habit." Terrell (1975) expressed a similar viewpoint while pointing out the strong differences in the type species of the three genera; he did not, however, provide details concerning the total variation. Data concerning seed types, chromosome numbers and pollen morphology were furnished for 39 North American species of *Houstonia* (Terrell, *et al.* 1986). Since 1986 I have concluded that putting most of the North American species in *Houstonia* is as wrong as placing them all in *Hedyotis*. At present, I recognize for North America, approximately 20 species in *Houstonia* (a genus restricted to North America), 20 species in *Hedyotis* (with most species in Asia) and 10 species in *Oldenlandia* (excluding West Indies species). Further data regarding all three genera are being summarized in a subsequent paper.

The *bona fide* species of *Oldenlandia* have the following principal characteristics: small annual or perennial herbs; corollas small, usually less than 8 mm long, rotate or more or less funnelform or salverform; homostylous or heterostylous; capsules more or less subglobose, 4/5 to fully inferior; seeds minute (typically 0.2-0.4 mm long), numerous (usually 50-150) per capsule, trigonous or conic in shape, hilum punctiform at apex of an angle, testa minutely reticulate, areole walls straight or sinuous, often low and indistinct; chromosome number $x=9$. The seed characters and chromosome number especially distinguish *Oldenlandia* from *Hedyotis* and *Houstonia*. (The chromosome number $x=9$ occurs otherwise only in *Hedyotis nigricans*, which has much larger, compressed-ellipsoid seeds and other morphological differences indicating that it represents a separate phyletic line). Two of the species included here do not have these strictly oldenlandioid seed characters and chromosome number, but they have generally been included in *Oldenlandia* in the past and one of them (*O. salzmanni*) is tentatively retained there pending further study. Both clearly are different from *Houstonia* and *Oldenlandia*, so cannot be placed in those genera. The second species, *O. callitrichoides* Griseb., is being described by Terrell and W.H. Lewis as a new genus and is included here only to facilitate its identification.

The following generic description is based largely on the species included here (except *O. callitrichoides*). Also taken into account were the descriptions by Bremekamp (1952) in his monograph of African *Oldenlandia* and Standley (1918) in his treatment of the genus for the North American Flora.

GENERIC DESCRIPTION

Oldenlandia L., *Sp. Pl.* 119. 1753. LECTOTYPE SPECIES: *O. corymbosa* L., selected by Hitchcock & Green (1929).

Small annual or perennial herbs. Stems slender, erect, decumbent or creeping. Leaves opposite, sessile or petiolate. Stipules interpetiolar, small. Flowers small, in axillary or terminal glomerules or in cymes or solitary, homostylous (isostylous) or heterostylous (distylous), sessile or pedicellate. Calyx lobes (3-) 4(-5): calyx cup (hypanthium) cup shaped or hemispheric. Corollas 1.5(-8.5) mm long, rotate, funnelform or salverform, white, lavender, pink or purple, glabrous externally; tube shorter or longer than the (3-)4(-5) lobes. Stamens (3-)4(-5), anthers dorsifixed, sessile or on short filaments; filaments inserted on corolla tube at or below corolla sinuses. Stigmas 2 branched; styles filiform or thickened. Capsules small, bilocular, more or less subglobose, fused with calyx cup (hypanthium), 4/5 to fully inferior, loculicidally dehiscent or later also septicidally dehiscent. Seeds usually numerous (50-150) per capsule or in certain species ca 4-30 per capsule, black, brown or tan, minute to small, 0.1-0.4(-0.65 mm) long, usually trigonous or somewhat conic, or in certain species subglobose or oblongoid; hilum punctiform at apex of an angle or at apex of rounded ventral face; testa minutely reticulate; areole walls straight or sinuous, sometimes low and indistinct. Endosperm fleshy: embryo clavate (Standley 1918) or cylindrical. Basic chromosome number in many species $x=9$, in one species included here $n=15$.

KEY TO SPECIES

- A. Flowers and capsules sessile or on pedicels to ca 3 mm long, 1 to several in terminal or axillary glomerules.
 - B. Annual; leaves ovate or elliptic, 3-11 mm wide; calyces and capsules hirsute to glabrous; stipules with conspicuous narrow, marginal, often branched and ciliate, teeth to ca 5 mm long .. 2. *O. uniflora*
 - B' Perennial with woody tap root; leaves linear to narrowly elliptic, 1-3(-5) mm wide; calyces and capsules minutely papillose or verrucose to glabrous; stipules with narrow marginal teeth to ca 2 mm long 3. *O. boscii*
- A' Flowers and capsules on pedicels more than 3 mm long, not in glomerules.
 - C. Annual, erect, spreading, or decumbent; corollas inconspicuous, more or less obscured by calyx lobes 1. *O. corymbosa*
 - C' Perennial, creeping; corollas small but not obscured by calyx lobes.
 - D. Leaves broadly elliptic or ovate. 1.5-5.2 mm long, 0.7-2.5 mm wide, sessile or subsessile; corollas pink, purple or white, 2.5-5 mm long; capsules subglobose 4. *O. salzmännii*
 - D' Leaves suborbicular, subrhombic or broadly ovate, 0.5-4 mm long and wide, petioles 0.5-3 mm long; corollas white, 1.5-3.5

mm long; capsules narrowly turbinate or

obconic 5. *O. callitrichoides*

SYSTEMATIC TREATMENT

1. *Oldenlandia corymbosa* L., *Sp. Pl.* 119. 1753. TYPE: To be discussed in a separate paper. *Hedyotis corymbosa* (L.) Lam., *Tabl. Encycl.* 1:272. 1792.

Small annual herb. Stems slender, erect, spreading, decumbent or prostrate, to 2.4(-4) dm tall, usually branched, glabrous or puberulent. Leaves sessile or short petiolate, narrowly elliptic, elliptic, narrowly oblong, or linear, 5-40 mm long, 1-9 mm wide, glabrous or leaf bases ciliate. Stipules to 2 mm long, with 0-few marginal filiform teeth or colleters to 3 mm long. Flowers homostylous, cymose from the axils on slender peduncles to ca 15 mm long, (2-)3(-5) flowers on shorter pedicels from each peduncle, often flowering at most axils. Calyx lobes lanceolate, 0.5-1.3 mm long. Corollas rotate or short funnelform, white or occasionally faint lavender or pink, 1-2 mm long, partly obscured by calyx lobes, corolla tube and lobes about equally long, throat with white hairs. Anthers 0.2-0.3 mm long, attached to lower part of tube. Stigma and style less than 0.5 mm long, style thickened. Mature capsules 1-2.2 mm long, 1.3-2.8 mm wide, subglobose or slightly wider than long, 4/5 to fully inferior, glabrous, truncate or retuse. Seeds numerous per capsule, 0.2-0.4 mm long, trigonous. Flowering all year in tropical climates. Chromosome number: $n=9$, 18, 27; $2n=18$, 36, 54 (Lewis 1959, 1962, 1964, 1966b; and others).

Habitats: Disturbed places, lawns, roadsides. Distribution: Pantropic weed. United States: Mainly in Atlantic and Gulf Coastal Plains and Mississippi Embayment; South Carolina, southern Georgia, throughout Florida, southern parts of Alabama, Mississippi and Louisiana, and rare in eastern Texas. Becoming more common in continental U.S. Hawaii: Oahu, Hawaii, Maui. Also, West Indies and México: Nayarit, Tabasco, Chiapas; probably more common in México than indicated by available records. Standley (1918) did not list any records for México and United States, listing only West Indies, Central America and South America in the Western Hemisphere. Our plants are the diploid race of var. *corymbosa* (Lewis 1964).

2. *Oldenlandia uniflora* L., *Sp. Pl.* 119. 1753. TYPE: To be discussed in a separate paper. *Hedyotis uniflora* (L.) Lam., *Tabl. Encycl.* 1:272. 1792. *Edrastima uniflora* Raf., *Actes Soc. Linn. Bordeaux* 6:269. 1834.

Hedyotis auricularia Walter, *Fl. Carol.* 85. 1788. (non *H. auricularia* L., *Sp. Pl.* 101. 1753).

Oldenlandia glomerata Michx., *Fl. Bor.-Amer.* 1:83. 1803. *Hedyotis glomerata* (Michx.) Elliott, *Sketch Bot. S. Carolina* 1:188. 1816.

Stelmotis glomerata Raf., New Fl. 4:101. 1838. *Stelmanis glomerata* Raf., Autik. Bot. 13. 1840.

Hedyotis virginica Spreng., Pl. Min. Cogn. Pug. 2:34. 1815.

Hedyotis fasciculata Bertol., Mem. Reale Accad. Sci. Inst. Bologna 2:306. 1850. *Oldenlandia fasciculata* (Bertol.) Small, Fl. S.E. U.S. 1106. 1903. *H. uniflora* var. *fasciculata* (Bertol.) W.H. Lewis, Amer. J. Bot. 49:865. 1962.

Oldenlandia littoralis C. Mohr, Bull. Torrey Bot. Club 24:27. 1897.

Annual herb. Stems slender, erect, spreading or procumbent, to 4.5(-7.7) dm tall (sometimes flowering when plant very small), branched, densely white hirsute or pubescent to glabrous. Leaves sessile or short petiolate, ovate or elliptic, to 28 mm long, 3-11 mm wide, hirsutulous or pubescent to glabrous above or pubescent only on midrib and nerves, glabrous or pubescent on nerves beneath. Stipules to 2 mm long, with 1 to few, sometimes branched and ciliate linear or narrowly lanceolate marginal teeth, to ca 5 mm long. Flowers homostylous, sessile or on pedicels to ca 3 mm long, 1 to several in axillary and terminal glomerules. Calyx lobes ovate or ovate-lanceolate, 0.8-3 mm long, pubescent to glabrous. Corollas rotate, white or pale blue, inconspicuous, 0.7-1.3 mm long, usually shorter than calyx lobes. Anthers 0.1-0.2 mm long, attached to corolla tube at sinuses of lobes. Style and stigma 0.2-0.6 mm long; stigmas included in tube; style thickened. Mature capsules 1-2.5 mm long, 1-3 mm wide, subglobose or slightly wider than long, fully or 7/8 inferior, densely hirsute varying to glabrous. Seeds numerous per capsule, 0.2-0.3 mm long, trigonous. Flowering in United States in spring (Florida), summer, fall. Chromosome number: $n=18, 36$; $2n=36$ (Lewis 1962).

Habitats: Wet or moist places, lake shores, swamps, stream banks and sand bars, pine and deciduous woods (often in openings), savannahs, fields, roadsides and gravel pits. Distribution: United States: Mainly in Atlantic and Gulf Coastal Plains and Mississippi Embayment; New York (Long Island), New Jersey, Delaware, Maryland (southeast and Prince Georges Co.), District of Columbia; eastern parts and rare in piedmont of Virginia, North Carolina, South Carolina (incl. Pickens Co.) and Georgia; throughout Florida, Alabama, Mississippi, Louisiana, eastern Oklahoma, eastern Texas, southern Arkansas, southeastern Missouri, western Kentucky and western Tennessee. Also occurs in the West Indies in Cuba, Puerto Rico and Jamaica.

There is some variation in leaf shape and plant vestiture, but these variants, to which names (see synonyms) have been given, definitely vary as continua and I have had no hesitation in sinking these into one species.

3. *Oldenlandia boscii* (DC.) Chapm., Fl. Southern U.S. 181. 1860. *Hedyotis boscii* DC., Prodr. 4:420. 1830. TYPE: UNITED STATES. Carolina: 1798-1800, *Bosc s.n.* (HOLOTYPE: G-DC [not seen]; Microfiche: US!).

Small perennial herb with woody taproot. Stems slender, spreading, decumbent or prostrate, to 3 dm tall, or forming mats to ca 4 dm wide, much branched, glabrous to minutely papillose or puberulent. Leaves sessile, linear to narrowly elliptic, to 30 mm long, 1-3(-5) mm wide, glabrous to minutely papillose or puberulent above, glabrous or scabrous on midrib beneath. Stipules to 2 mm long, with 1 to several narrow marginal teeth to 2 mm long. Flowers homostylous, sessile or subsessile, 1 to several in axillary and terminal glomerules. Calyx lobes triangular to lanceolate, 0.8-2 mm long, glabrous or minutely papillose. Corollas rotate, white, pink or lavender, very small and inconspicuous, to ca 0.7-1 mm long. Anthers 0.1-0.3 mm long, included. Style and stigma less than 0.5 mm long; stigmas included; styles thickened. Mature capsules 1.5-3 mm long, 1.5-2.5 mm wide, subglobose or slightly longer than wide, fully or 7/8 inferior, verrucose or papillose with minute rounded papillae, varying to glabrate. Seeds numerous per capsule, 0.1-0.3 mm long, trigonous. Flowering April to November. Chromosome number: $2n=36$ (Lewis 1962).

Habitats: Wet or moist places, stream banks, lake shores, roadsides, ditches, fields, woods, savannahs, disturbed open places. Distribution: United States: Mainly in Atlantic and Gulf Coastal Plains and Mississippi Embayment in the southeastern states, also in other physiographic provinces, including Ozarks; southeastern Virginia, North Carolina (one county in southeast), South Carolina (incl. Pickens Co.), southwestern (and one county in northern) Georgia, northern Florida, Alabama, Mississippi, central and western Tennessee, Louisiana, Arkansas, southeastern Missouri, eastern Oklahoma and eastern Texas.

Oldenlandia boscii does not seem to vary much in morphology over its range, in contrast to most other taxa in this and related genera.

4. *Oldenlandia salzmannii* (DC.) Benth. & Hook. f. ex B.D. Jacks., Index Kew. 2:336. 1894; Benth. & Hook. f., *Gen. Pl.* 2:58. 1873. *ined.* (see Fosberg & Terrell 1985). *Anotis salzmannii* DC., *Prodr.* 4:433. 1830. TYPE: "Bahiam," *Salzmann s.n.* (not seen). *Hedyotis salzmannii* (DC.) Steud., *Nomencl. Bot.*, ed. 2. 1:726. 1840.

Hedyotis thesiifolia A. St. Hil., *Voy. Distr. Diam.* 1:397. 1833. *Oldenlandia thesiifolia* (A. St. Hil.) K. Schum. in Martius, *Fl. Bras.* 6, 6:270, pl. 127, f. 1. 1889.

Small creeping perennial herb. Stems slender, prostrate, rooting at nodes, glabrous. Leaves sessile or subsessile, broadly elliptic to ovate, 1.5-5.2 mm long, 0.7-2.5 mm wide, glabrous to sparsely hirsute. Stipules to ca 0.5 mm long, entire or with 1 to few marginal white hairs to 0.7 mm long. Flowers heterostylous, solitary, terminal and axillary on slender pedicels 3-12 mm long. Calyx lobes lanceolate, ovate, or oblong, 1-2.2 mm long, glabrate. Corollas subsalverform, pink, lavender, purple or white, 2.5-5 mm long, tube 1-2.2 mm

long, short and broad, densely hirsutulous or pubescent within: lobes ovate, equalling or longer than the tube. Anthers 0.5-0.8 mm long. Stigma branches (0.5-)1-1.5 mm long. Pin flowers with stigmas exerted 1-2 mm and anthers at distal end of tube; thrum flowers with anthers exerted on filaments 1 mm long and the stigmas included. Mature capsules ca 1.5 mm long and wide, subglobose, 7/8 to fully inferior, hirsute. Seeds ca 4-14 per capsule, 0.3-0.5 mm in diameter, trigonous. Flowering June to August, at least in western Florida and adjacent Alabama. Chromosome number: $n=15$, $2n=30$ (Lewis 1966a).

Habitats and distribution: South America: Brazil, Argentina. Uruguay, Paraguay. United States: Locally established, apparently accidentally, near Pensacola, Escambia Co., western Florida and in adjacent Baldwin Co., Alabama, in roadside ditch, by ponds and at edge of a marsh, where discovered by J.R. Burkhalter of Pensacola (Fosberg & Terrell 1985). The name, *O. salzmannii*, is here accepted as correct pending study of the type specimens.

5. *Oldenlandia callitrichoides* Griseb., Mem. Amer. Acad. Arts n.s. 8:506. 1863. TYPE: Discussed in pending publication, as noted below. *Hedyotis callitrichoides* (Griseb.) W.H. Lewis, Rhodora 63:222. 1961.

Small creeping perennial herb. Stems soft, thin, prostrate, rooting at nodes, glabrous. Leaves with slender petioles 0.5-3 mm long; blades thin, suborbicular, broadly ovate or subrhombic, 0.5-4 mm long, 0.5-4.8 mm wide, sparsely covered above with scattered stiff white hairs to ca 0.5 mm long or infrequently glabrate. Stipules minute, with 0 to few whitish marginal hairs. Flowers apparently homostylous, solitary from axils on filiform pedicels to ca 2 cm long. Calyx lobes lanceolate or ovate, 0.3-1 mm long, ciliated along the margins and sinuses. Corollas subsalverform, white or lobes purplish tipped, 1.5-3.5 mm long, tube slightly shorter than lobes. Anthers 0.2-0.3 mm long, exerted at mouth of tube on filaments to 0.3 mm long. Style and stigma 1.5-2 mm long, with the stigma exerted to or beyond anthers. Mature capsules 1-2.7 mm long, 0.5-2 mm wide, narrowly turbinate or narrowly obconic, widest at apex, 9/10 to fully inferior, glabrous below ciliate calyx lobes, eventually splitting apart into 4 narrow segments. Seeds ca 20-35 per capsule, 0.3-0.5 mm long, ellipsoid, rhomboid or obtusely several angulate. Flowering September to January in Bahamas (Correll 1982). Chromosome number: $2n=22$ (Terrell, *et al.* 1986).

Habitats and distribution: Moist or wet soil in grassy places, disturbed places, on rocks and cliffs, lawns, walls, curbs, stonework. West Indies, Panamá, Yucatán. Adventive in Guyana; Sierra Leone in Africa; United States, Miami, Florida, at two locations: Vizcaya Art Museum on cement fountains and water channels; shaded, grassy place at Fairchild Tropical Garden; Hawaii: Oahu, Maui. As noted in Introduction, this species is being placed in a new genus by Terrell and W.H. Lewis.

ACKNOWLEDGMENTS

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NEW NAMES AND COMBINATIONS IN MEXICAN *ALLOISPERMUM*
(ASTERACEAE: HELIANTHEAE)

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ABSTRACT

Six new specific combinations and two new varietal combinations for the genus *Alloispermum* are proposed, as follows: *A. gonzalezae* (B. Turner) B. Turner, *A. longiradiatum* (Urbatsch & B. Turner) B. Turner, *A. michoacanum* (B.L. Robins.) B. Turner, *A. michoacanum* var. *liebmannii* (Schultz-Bip. ex Klatt) B. Turner, *A. palmeri* (S. Wats. ex A. Gray) Fernandez & Urbatsch, *A. palmeri* var. *lanceifolium* (Urbatsch & B. Turner) Fernandez & Urbatsch and *A. tridacoides* (Urbatsch & B. Turner) Fernandez & Urbatsch. All of these are transfers from the genus *Sabazia*.

KEY WORDS: *Alloispermum*, Asteraceae, Heliantheae, systematics, México.

As treated by Fernandez & Urbatsch (in manuscript), *Alloispermum* is a genus of perhaps 14 species, mostly confined to montane habitats of México, Central America and northern South America. It is very closely related to *Sabazia* and may ultimately encompass that taxon. The two are kept apart largely on features of habit and capitulescence, *Alloispermum* having rather simple stems that arise from short, stout, subterranean rhizomes and a capitulescence that arises from primary peduncles that branch near the summit forming cymules of 3 to numerous heads. Species of *Sabazia*, as treated by the present author, have annual taproots or, when perennial, aerial stems arise from slender, wiry, rhizomes, the lower stems often decumbent and rooting at the nodes; in addition, the heads are usually solitary on elongate terminal or axillary peduncles.

Urbatsch & Turner (1975) placed several of the species included here in the genus *Sabazia*, having removed these from *Calea* where they were anomalous. Robinson (1978) subsequently resurrected the older generic name, *Alloispermum*, to house these and we accept the reality that they are properly positioned there. McVaugh (1984), in his usual conservative vein, retained most of the aforementioned anomalies in his heterogeneous *Calea*, but also maintained

Sabazia (by insertion of the latter within *Calea*, he creates a phyletically indefensible position). In any case, I intend to retain *Calea*, *Sabazia* and *Alloispermum* in my treatment of the tribe Heliantheae for México, believing these to be separate, closely related phyletic lines. Additional work will be needed to resolve the relationship of the latter two genera with the closely related genera *Galinsoga* and *Schistocarpha*, as noted by Fernandez & Urbatsch.

Alloispermum gonzalezae (B. Turner) B. Turner, *comb. nov.* BASIONYM: *Sabazia gonzalezae* B. Turner, *Phytologia* 63:307. 1987.

As noted in my original description, inclusion of this taxon in *Sabazia* was provisional. A review of the entire *Alloispermum-Sabazia-Galinsoga* complex now leads me to believe that it is properly positioned in *Alloispermum*, near *A. tridacoides*.

Alloispermum longiradiatum (Urbatsch & B. Turner) B. Turner, *comb. nov.* BASIONYM: *Sabazia longiradiata* Urbatsch & B. Turner, *Brittonia* 27:353. 1975.

This species is superficially similar to *A. palmeri* but differs in its shorter stature, fewer leaves along the stems and much longer rays. On habitat features and its branched capitulescence it belongs to *Alloispermum*.

Alloispermum michoacanum (B.L. Robins.) B. Turner, *comb. nov.* BASIONYM: *Sabazia michoacana* B.L. Robins., *Proc. Amer. Acad. Arts* 27:173. 1892.

Two varieties are recognized under this species, as follows:

1. Peduncular hairs with purple crosswalls; leaves mostly widest at or near the base var. *liebmannii*
- 1' Peduncular hairs without purple crosswalls; leaves widest at or near the middle; Michoacán var. *michoacanum*

Alloispermum michoacanum var. *michoacanum*. *Sabazia michoacana* B.L. Robins., *Proc. Amer. Acad. Arts* 27:173. 1892. *Sabazia liebmannii* var. *michoacana* (B.L. Robins.) Longpre.

Known only from Michoacán in pine-oak forests, 2000-3100 m.

Alloispermum michoacanum* var. *liebmannii (Schultz-Bip. ex Klatt) B. Turner, *comb. nov.* BASIONYM: *Sabazia liebmannii* Schultz-Bip. ex Klatt, *Leopoldina* 23:90. 1887. Not *Alloispermum liebmannii* (Schultz-Bip. ex Klatt) H. Robins., *Phytologia* 38:412. 1978, which is based upon *Calea liebmannii* Schultz-Bip. ex Klatt, *Leopoldina* 23:145. 1887. *Sabazia liebmannii* Schultz-Bip. ex Klatt var. *liebmannii*.

Sabazia liebmannii var. *hintonii* Longpre.

Sabazia liebmannii var. *ovatifolia* Longpre.

México State, Guerrero and Oaxaca in pine-oak woodlands, 2000-2900 m.

A variable taxon but readily distinguished from var. *michoacanum* by the characters given in the above couplet.

Alloispermum palmeri (S. Wats. ex A. Gray) Fernandez & Urbatsch, *comb. nov.* BASIONYM: *Calea palmeri* S. Wats. ex A. Gray, Proc. Amer. Acad. Arts 22:430. 1887.

Alloispermum palmeri* var. *lancifolium (Urbatsch & B. Turner) Fernandez & Urbatsch, *comb. nov.* BASIONYM: *Sabazia palmeri* var. *lancifolia* Urbatsch & B. Turner, Brittonia 27:353. 1975.

Alloispermum tridacoides (Urbatsch & B. Turner) Fernandez & Urbatsch, *comb. nov.* BASIONYM: *Sabazia tridacoides* Urbatsch & B. Turner, Brittonia 74:351. 1975.

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I am grateful to Dr. Guy Nesom and Dr. Andrew McDonald for reviewing the present paper and to Dr. Lowell Urbatsch for sending me an advance copy of his paper with Fernandez and publishing in advance their several new combinations which they will treat in more detail in their forthcoming systematic study of the genus.

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CORRECTIONS IN THE TYPE LOCALITY CITATION OF
VERBESINA HOWARDIANA

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ABSTRACT

The type locality of *Verbesina howardiana* was incorrectly cited as the Dominican Republic. The specimen cited was actually collected on the island of Dominica.

KEY WORDS: *Verbesina*, Asteraceae, Lesser Antilles, systematics.

In the paper containing the original description of *Verbesina howardiana* (Olsen 1989), the species was cited to be found in the Dominican Republic. In fact, the plant has been found only on the island of Dominica. The error resulted from a mistake in my concept of Caribbean geography, as an incorrect connection was made between Dominica (where the specimens originated) and "the Dominican" (a common reference to the Dominican Republic).

Corrections are required in three places in the original publication, all on page 107. The first is in the title, where DOMINICA should replace THE DOMINICAN REPUBLIC. Second, in the abstract, Dominica should replace Hispanola. The third error is in the type citation where DOMINICA should replace DOMINICAN REPUBLIC.

ACKNOWLEDGMENTS

I wish to thank Dr. Dan Nicolson for bringing the error to my attention.

LITERATURE CITED

- Olsen, J. 1989. A new species of *Verbesina* section *Verbesinaria* from the Dominican Republic. *Phytologia* 67:107-108.

A NEW SPECIES OF *APHANACTIS* (ASTERACEAE: HELIANTHEAE;
GALINSOGINAE), FROM OAXACA, MÉXICO

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ABSTRACT

A new species, *Aphanactis macdonaldii* B. Turner, from Cerro Quiexobra, 3650-3800 m, Oaxaca, México is described and illustrated. The genus was previously unknown to México. The species is notable for its large heads with bright yellow rays, unlike any previously described species.

KEY WORDS: *Aphanactis*, Asteraceae, Heliantheae, systematics, México, Oaxaca.

Routine identification of a remarkable assemblage of species belonging to the Asteraceae collected by Dr. Andrew McDonald from the subalpine region of Cerro Quiexobra (3650-3800 m) resulted in the description of seven new species from that peak alone (Nesom, in prep.; Turner, in prep.). The most remarkable discovery has been the present species, which is placed in *Aphanactis*, the first report for that genus from México, although two species are known from Central America (Turner 1980).

Aphanactis macdonaldii B. Turner, *sp. nov.*, Figure 1. TYPE: MÉXICO.

Oaxaca: 35 km ESE of Miahuatlán, 5 km NE of Santo Domingo Ozolotepec, Cerro Quiexobra and vicinity, 3650-3800 m (16° 10' N, 96° 15' W), timberline vegetation in open glades along ridges and in mountain saddles, 10 Dec 1989, *Andrew McDonald 2904* (HOLOTYPE: TEX; Isotype: MEXU).

Aphanactis obtusatae (S.F. Blake) B. Turner similis sed foliis majoribus plerumque basalibus et capitulis majoribus ligulis luteis profunde 3-lobatis differt.

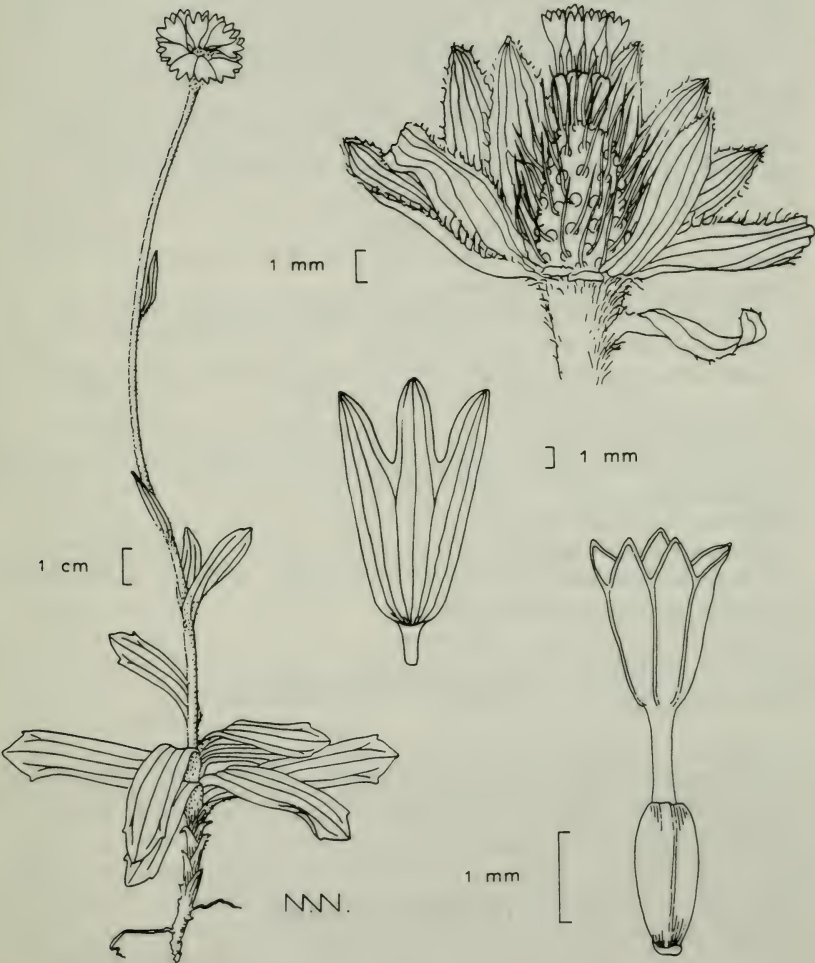


Fig. 1. *Aphanactis macdonaldii*, from holotype.

Perennial, nearly scapose, herbs 15-25 cm high, the stems erect and arising from relatively thick lateral rhizomes. Lowermost leaves mostly opposite, sessile, linear-oblongate, much reduced and remote along the upper portion of the stem, the blades with 3-7 nearly parallel nerves, moderately hirsutulous throughout, the apices 3 lobed or not. Heads hemispheric, ca 3 cm wide across the extended rays, borne singly on nearly leafless scapes 5-20 cm long. Involucres 9-11 mm high, the bracts ovate-elliptical, mostly subequal in 2-3 series, pilose like the peduncles. Receptacle broadly conical, the chaff filiform. Ray florets 11-13, pistillate, fertile, the ligules bright yellow, deeply 3 lobed, ca 15 mm long, 7-9 mm wide, the tube ca 2.5 mm long, pubescent. Disk florets numerous, the corollas yellow, the tube pubescent, ca 1 mm long, the limb glabrous, ca 2 mm long with 5 lobes ca 0.5 mm long. Achenes ca 3 mm long, obovate, 5 ribbed, black, glabrous, epappose.

The species is remarkable for its large heads with bright yellow rays. Indeed, it is so distinct from the other species in habit that I originally thought it might belong to *Selloa* (which it superficially resembles) or else might represent an undescribed genus. Detailed comparison of the heads, florets and achenes with those of *Aphanactis*, however, strongly suggests that it goes with or near that genus. So positioned, the characters of the genus are expanded to include large, yellow, 3 lobed ligules (vs single and white or pinkish) and disk florets with rather tubular throats.

It is a pleasure to name this remarkable species for its remarkable collector, Dr. Andrew McDonald, avid student of the alpine vegetation of México and expert on the family Convolvulaceae.

ACKNOWLEDGMENTS

I am grateful to Dr. Guy Nesom for the Latin diagnosis and to him and Dr. McDonald for a review of the manuscript itself. Ms. Nancy Webber provided the illustration.

LITERATURE CITED

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PANICUM RIGIDULUM VAR. *COMBSII* (POACEAE) IN LOUISIANA

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ABSTRACT

The occurrence of *Panicum rigidulum* var. *combsii* is documented in Louisiana from Natchitoches Parish.

KEY WORDS: Floristics, *Panicum*, Poaceae, Louisiana.

Hitchcock & Chase (1910) listed seven species for the Agrostioidea group of *Panicum*: *P. agrostoides* Spreng., *P. anceps* Michx., *P. combsii* Scribn. & Ball, *P. condensum* Nash., *P. longifolium* Torr., *P. rhizomatum* Hitchc. and *P. stipitatum* Nash. Fernald (1934; 1950) listed *P. combsii* as a variety of *P. longifolium*: *P. longifolium* Torrey var. *combsii* (Scribn. & Ball) Fern. Within the group Agrostioidea, Hitchcock (1951) included the same seven species as in Hitchcock's & Chase's (1910) treatment, but also included *P. abscissum* Swallen, and retained *P. combsii* at the species level. Gould (1975) considered *P. agrostoides*, *P. condensum*, *P. longifolium* and *P. stipitatum* to be synonymous with *P. rigidulum* Bosc ex Nees. Lelong (1984) retained varietal status for *P. combsii* within *P. rigidulum*.

Panicum rigidulum var. *combsii* (Scribn. & Ball) Lelong is not listed for Louisiana by Allen (1980) and MacRoberts (1988) found no reports of it for Louisiana. Based on a specimen taken at Lake Charles by Chase (*Chase 4434*, US), Hitchcock & Chase (1910) and Hitchcock (1951) included Louisiana within the range of this taxon treated as *P. combsii*. Additionally, Fernald (1934) listed a specimen of the taxon from New Orleans, but no information was provided on the collector, collection number, or the herbarium where the specimen was located.

A recent specimen of *P. rigidulum* var. *combsii* for Louisiana was collected in Natchitoches Parish, in dry, sandy soil of a longleaf pine (*P. palustris* Mill.) hillside, above a hillside seep, northwest of the intersection of Middle Branch Rd. and U.S. Forest Service Rd. 321, 2 Aug 1985 (*McKenzie 171* with L.E. Urbatsch, Annette Parker and Karla Wilzer, LSU; annotated by M. Lelong,

March 1989). This site is more similar to the "wet pine-barrens" designated for the taxon by Fernald (1950) than to the "marshes, shores of lakes and ponds" described as the habitat in Mississippi (Lelong 1986). The paucity of collections from Louisiana suggests that *P. rigidulum* var. *combsii* is rare in the state. It is likewise rare in Mississippi, where it is known only from Harrison County (Lelong 1986).

Within the typical subgenus of *Panicum*, *P. rigidulum* is recognizable by its short knotty bases or caudexes, often densely tufted culms, and strongly compressed sheaths and culms. *Panicum rigidulum* var. *combsii* differs from the more widespread and common typical variety by its narrower more pubescent leaves and larger spikelets. The former variety possesses adaxially pilose leaf blades usually 2-7 mm wide with fimbriate-ciliate membranous ligules, spikelets 2.6-3.7 mm long and usually purple, slender, erect pedicels.

ACKNOWLEDGMENTS

We thank Mary Sangrey, U.S. National Herbarium, Washington, D.C. and the Department of Botany, Louisiana State University, Baton Rouge for their assistance with this report.

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TAXONOMIC SUMMARY OF *ERICAMERIA* (ASTERACEAE: ASTEREA),
WITH THE INCLUSION OF *HAPLOPAPPUS* SECTS. *MACRONEMA*
AND *ASIRIS*

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ABSTRACT

Ericameria sensu stricto (12 species) is broadened to include the species of sect. *Stenotopsis* (1 species), sect. *Macronema* (Nutt.) Nesom (9 species) and sect. *Asiris* (H.M. Hall) Nesom (5 species). The nomenclature for the 27 species of *Ericameria* as so defined is summarized and criteria for the distinction of the sections are presented in a key. New specific combinations are proposed for *E. compacta*, *E. crispa*, *E. discoidea*, *E. gilmanii*, *E. greenei*, *E. obovata*, *E. ophitidis*, *E. suffruticosa*, *E. watsonii* and *E. zionis*. One new varietal combination is proposed, *Ericameria discoidea* var. *linearis*.

KEY WORDS: *Ericameria*, *Haplopappus*, Asteraceae, Astereae.

Ericameria has been understood to include a group of subshrubby species with narrow, entire, punctate-resinous leaves, small heads commonly in corymbose capitulescences and a base chromosome number of $x=9$. The genus has not been generally accepted by floristicians since Hall's treatment of it as *Haplopappus* sect. *Ericameria* (Hall 1928), although recent studies (primarily Johnston 1970 and Urbatsch, 1975; 1976; 1978; 1979) have recognized it as distinct.

Nesom, *et al.* (submitted) have sharpened the definition of *Ericameria* by removing from it as a separate genus, seven species (see Excluded Species, below) closely related to *Euthamia*, but distantly related to species traditionally recognized as *Haplopappus*. Plants of the new genus can be distinguished morphologically by characteristics of their involucre bracts, which have a white indurated, enervate basal portion and a glandular herbaceous patch on the upper portion, and their disc corollas, which are zygomorphic, the lobes strongly uneven in length. In contrast, plants of *Ericameria* have involucre bracts without an apical glandular patch, but with a clear midvein from base to tip and their disc corollas are regular with lobes of even length.

Although Hall (1928) segregated the species of *Haplopappus* sect. *Asiris* within his broad concept of *Haplopappus*, some were originally included in *Ericameria* by Nuttall, and some were again included in that genus by Urbatsch in his contribution to a checklist of North American plants (Kartesz & Kartesz 1980). One of the six species originally recognized by Hall in sect. *Asiris*, *H. purpusii*, is included in the new genus being described by Nesom, *et al.* (submitted). A connection between *Macronema* (*Haplopappus* sect. *Macronema*) and *Ericameria* has not been generally recognized, although Macbride (1918, see comments below) transferred *Haplopappus bloomeri* to *Ericameria*. A close similarity between sect. *Macronema* and sect. *Asiris*, however, has been acknowledged as they are treated together in keys (e.g., Ferris 1960; Cronquist 1973). *Ericameria linearifolia*, one of the two species of *Stenotopsis* (*Haplopappus* sect. *Stenotopsis*), has been transferred to *Ericameria* by Urbatsch & Wussow (1979). The other species, *E. parrasana*, is part of the new genus.

An overview of the taxonomy of *Ericameria* has not been published since Hall's treatment of *Haplopappus*. In the course of studying the generic boundaries of *Ericameria* for a floristic treatment of the Mexican species as well as for the separation of a new genus, I have arrived at a broadened view of the former, which is presented below.

There are two primary areas of difficulty in formulating a clear definition of *Ericameria*, the first involving sect. *Stenotopsis*, the second involving sects. *Macronema* and *Asiris*.

Section *Stenotopsis*

The first problem involves the relationship of typical *Ericameria* with *E. linearifolia*, which was segregated as the genus *Stenotopsis* Rydb. and included as one of the two species of *Haplopappus* sect. *Stenotopsis* (Rydb.) H.M. Hall. Extensive and well documented natural hybridization (Urbatsch & Wussow 1979; Cody & Thompson 1986) exists between *E. linearifolia*, which has long, merely bracteate peduncles with large, solitary heads with long, prominent ray flowers and 3 veined, stipitate glandular phyllaries, and *E. cooperi*, which is morphologically more typical of *Ericameria*. These two species have similarly colored pappus bristles and similarly shaped style appendages, and because of this, they are considered by Urbatsch & Wussow to be closely related and both placed in *Ericameria* sect. *Stenotopsis*. Considering the large differences between these two species, however, the small morphological similarities used by these workers to unite them are likely to be fortuitous. If the main criterion for associating the two species is ease of hybridization, attempts of artificial crosses between *E. linearifolia* and other species of *Ericameria* should be considered in the formulation of more meaningful hypotheses of close relationship. This is particularly true in view of the natural hybrids known between *Haplopappus macronema* and *Chrysothamnus nauseosus* (Anderson & Reveal 1966), which also are extremely divergent in morphology.

Although *Ericameria linearifolia* falls outside the boundaries of typical *Ericameria* in some features, it produces somewhat flattened, 6-8 nerved achenes and punctate leaves, which are characteristic of the genus. Its large, solitary heads and long ray flowers are more similar to those of species of sect. *Macronema*. *Ericameria cooperi* is much more similar to typical *Ericameria* in its small, discoid, apically clustered heads, but its turbinate-subcylindric achenes with 10-12 thin nerves are atypical.

Sections *Macronema* and *Asiris*

The second problem in defining *Ericameria* involves its distinction from *Haplopappus* sects. *Macronema* and *Asiris*. The following key provides contrasts that, with the caveats discussed below, separate these groups from *Ericameria* and *Stenotopsis*.

1. Leaves flat and obovate to terete and linear, sometimes in axillary fascicles, usually resinous from punctate glands; involucre bracts with a thick to thin, prominent, orange resinous midvein often expanded at the very apex, the bract apices rounded to acute but apiculate or appendaged in 2 species; collecting appendages of the disc style branches most narrowly triangular and equal or shorter in length than the stigmatic portions, rarely linear and longer; achenes narrowly oblong, most commonly compressed or flattened, with (4-)6-8(-12) nerves, sometimes subterete 2
2. Heads mostly in panicles or corymboid capitulescences, solitary in one species; phyllaries 1 nerved, papillate glandular in one species but not stipitate glandular; ray flowers absent or with short, inconspicuous ligules sect. *Ericameria*
- 2' Heads solitary; phyllaries 3 nerved, stipitate glandular; ray flowers with long, prominent ligules sect. *Stenotopsis*
- 1' Leaves narrow and mostly flat, not in axillary fascicles, resinous but apparently eglandular or with stipitate glands; midvein of the involucre bracts orange resinous to greenish yellow, the bract apices rounded to acute, with a pronounced, herbaceous apiculum or appendage; collecting appendages of the disc style branches linear to linear lanceolate, longer than the stigmatic portions; achenes narrowly cylindric to flattened, 3-5 nerved 3
3. Heads relatively large, solitary to clustered, immediately subtended by leaf like bracts; involucre bracts apically apiculate to appendaged, with a definite, orange resinous midvein, not keeled; achenes cylindric to slightly compressed, 5 nerved sect. *Macronema*

- 3' Heads relatively small, clustered, without definite leaf like bracts; involucre bracts apically apiculate, with a thin, greenish yellow midvein, often slightly keeled; achenes distinctly flattened, 3-4
nerved sect. *Asiris*

Ericameria, *Macronema* and *Asiris* each comprise species with variably shaped leaves and solitary to clustered heads variable in size. The heads in both may be eradiate or radiate with ray corollas variable in size. The distinction between them appears to lie in the nature of the leaf glandularity, the shape and nervation of the achenes and the shape of the style branch collecting appendages and their length relative to the stigmatic portion. The species of sect. *Asiris* and those of sect. *Macronema* are more closely similar between themselves, as evidenced by their apiculate involucre bracts, long linear style appendages and few nerved achenes. The species of sect. *Asiris* are divergent from the species of *Macronema* in their narrower heads with more thinly herbaceous involucre bracts and their peduncles that are not so strongly leafy.

The definition, however, between *Ericameria* and *Macronema* loses significant clarity because of overlapping variation in both groups. This is particularly true in *Ericameria*, where *E. pinifolia* is strongly similar to *Macronema* in its apiculate to appendaged involucre bracts, linear style branches longer than the stigmatic portions and narrowly cylindrical achenes. Further, the leaves of some plants of this species are not at all punctate. The generic affinity of *E. pinifolia* has never been questioned and it belongs firmly in *Ericameria*, where it is closely related to the type species of the genus, *E. ericoides*, which also shows some of the same *Macronema* like features. The differences between the groups in achene shape and nervation are not constant, because *E. palmeri* has achenes typical of *Macronema*, terete with (4-)5(-7) nerves. The achenes of *E. cooperi* are terete to slightly compressed, and along with those of several other species, *E. parishii* and *E. pinifolia*, may produce up to 12 nerves.

Finally, some plants of *Haplopappus* (sect. *Macronema*) *bloomeri* produce leaves that clearly are punctate resinous. Macbride's (1918) transferral of this species to *Ericameria* was made without specific comment, but perhaps reflected his reliance upon this criterion to distinguish *Ericameria*. *Haplopappus bloomeri* is highly variable in a number of other characteristics, as evidenced by the number of infraspecific taxa that have been named within it (see Hall 1928). *Ericameria pinifolia* is equally as variable, and because the variability in each species includes forms that are morphologically "shifted" toward the other, an investigation of these species for the possibility of hybridization should be interesting.

Parallel variation in *Chrysothamnus*

Chrysothamnus appears to be very closely related to *Ericameria* and *Macronema*, particularly the latter (Anderson 1970), but it is generally accepted as a

distinct genus (Hall & Clements 1923; Blake 1926; Anderson 1984). It is more homogenous than either *Ericameria* or *Macronema* in its densely arranged, narrow, strictly eradiate heads and its involuclral bracts in vertical files. Substantial variation occurs within *Chrysothamnus*, however, in the same characters that separate *Ericameria* from *Macronema* (Anderson 1970). The leaves of most species are resinous but non punctate, yet they are punctate in others. The achenes are variable in shape (terete to flattened) and in number of nerves, and the style branch collecting appendages vary from shorter to longer than the stigmatic portions. The species have been arranged into sections by Anderson (1984) to account for aspects of this variability.

Other $x=9$ groups of *Haplopappus*: *Hesperodoria*, *Petradoria*, *Stenotus*,
Tonestus and *Oreochrysum*

Hesperodoria E. Greene (*Haplopappus* sect. *Hesperodoria* [E. Greene] H.M. Hall), with slightly resinous punctate leaves, may be related to the group of genera around *Ericameria*, but its scabrous margined leaves and strongly turbinate heads are unlike any species there. In its general habit, it is more like *Petradoria*, whose composition and systematic position has been somewhat ambiguous, although it appears to be closely related to *Chrysothamnus* (Anderson 1963; 1983; 1984).

Stenotus Nutt. (*Haplopappus* sect. *Stenotus* [Nutt.] A. Gray) appears to be situated outside of the closely related elements of the *Ericameria* group, contrary to an earlier hypothesis (Nesom 1989). In contrast to *Ericameria* and *Macronema*, as well as *Chrysothamnus* (excluding *Petradoria*), plants of *Stenotus* are uniformly low, caespitose and monocephalous herbs. They are perennials, but on the basis of morphology, *Stenotus* clearly does not belong in the *Ericameria-Asiris-Macronema* lineage as a "woody shrub" as indicated by Clark, *et al.* (1980), although it is similar in flavonoids to those taxa.

Plants of *Tonestus* A. Nels. (*Haplopappus* sect. *Tonestus* [A. Nels.] H.M. Hall) are also herbaceous and they are further characterized by thick caudex branches or rhizomes, plants mostly single stemmed from the base, leaves with a strong tendency to produce spinulose toothed margins and thin herbaceous bracts that nearly enclose the heads. Some of the species of *Stenotus* have been confused with *Tonestus* but the latter is clearly not a member of the *Ericameria-Macronema* alliance (Nesom & Morgan, submitted). Plants of the monotypic *Oreochrysum* Rydb. (*Haplopappus* sect. *Oreochrysum* [Rydb.] H.M. Hall) are rhizomatous, non resinous herbs with broad, relatively thin, clasping leaves and herbaceous, reflexing involuclral bracts and could only be distantly related to *Ericameria*. Anderson & Creech (1975) included it within *Solidago*. Apart from *Ericameria* and its close relatives as recognized in the present paper, and from *Hesperodoria* and *Petradoria*, the species of *Stenotus*, *Tonestus* and *Oreochrysum* are the others of *Haplopappus* (sensu Hall 1928) with a base chromosome number of $x=9$.

In summary, the species of *Ericameria* (12), *Stenotopsis* (1), *Macronema* (9) and sect. *Asiris* (5) constitute four apparently closely related lineages that are overlapping in morphology. Natural hybridization occurs between *Ericameria* and *Stenotopsis*. On morphological grounds, *Chrysothamnus* is also closely related to these groups and natural hybrids are known between *Macronema* and *Chrysothamnus*, but *Chrysothamnus* is generally accepted as a distinct genus. To provide a taxonomic framework for these four sections of *Haplopappus* sensu Hall that are closely related to *Chrysothamnus*, there are several options. First, *Ericameria*, *Stenotopsis*, *Macronema* and *Asiris* might each be recognized as a separate genus, or *Ericameria* (with *Stenotopsis*) and *Macronema* (with *Asiris*) could be recognized, but in either case, there would be no morphological features to consistently separate the generic units. Alternatively, *Ericameria* could be expanded to bring the species of all four sections into a single taxon of coordinate rank with *Chrysothamnus*, resulting in the recognition of two closely related genera with similar patterns of variation among their respective species.

If, as hypothesized by Clark, *et al.* (1980) on the basis of flavonoid profiles, *Ericameria* proves to be closest to the ancestral form in this group, with *Macronema* and perhaps *Asiris* as derivatives, and if the closest relative of *Macronema* proves to be *Chrysothamnus*, strict adherence to principles of cladistic classification would necessitate the merger of *Chrysothamnus* with all the rest. This would be extremely difficult to justify on a pragmatic basis, however, in view of the careful and detailed morphological and anatomical investigations of *Chrysothamnus* by Loran Anderson, which have not suggested that it is congeneric with *Macronema*.

In order to clarify the boundaries of *Ericameria*, seven species have been removed as a separate, distantly related genus (Nesom, *et al.* submitted). In a correlated step, I propose to enlarge *Ericameria*, recognizing it as closely related to *Chrysothamnus*, and leaving as *Haplopappus* and its close relatives a group of species of South America (and North America if *Hazardia* is included) with the base chromosome number of $x=5$ (Brown & Clark 1982).

Taxonomic Summary of *Ericameria*

Ericameria Nutt., Trans. Amer. Philos. Soc., ser. 2 7:318. 1841. TYPE SPECIES: *Ericameria microphylla* Nutt., *nom. nov. illeg.* (= *E. ericoides*).

As pointed out by Hall (1928), Nuttall arbitrarily adopted a new epithet ("microphylla") when he transferred the type species to the new genus *Ericameria*. He cited "*Haplopappus ericoides* (Less.) DC." as the name his new one would replace, but that combination was first made by Hooker & Arnott.

The following species are included, with partial synonymy.

A. *Ericameria* sect. *Ericameria*

1. *Ericameria arborescens* (A. Gray) E. Greene, *Man. Bot. S.F. Bay Reg.* 175. 1894. *Bigelovia arborescens* A. Gray, *Proc. Amer. Acad. Arts* 8:640. 1873. *Haplopappus arborescens* (A. Gray) H.M. Hall, *Univ. California Publ. Bot.* 7:273. 1919.
2. *Ericameria brachylepis* (A. Gray) H.M. Hall, *Univ. California Publ. Bot.* 3:56. 1907. *Bigelovia brachylepis* A. Gray, *Bot. California* 1:614. 1876. *Haplopappus brachylepis* (A. Gray) H.M. Hall, *Univ. California Publ. Bot.* 7:273. 1919; *non* Phil. *Haplopappus propinquus* S.F. Blake, *nom. nov.*, *Contr. U.S. Natl. Herb.* 23:1490. 1926.
- 3a. *Ericameria cooperi* (A. Gray) H.M. Hall, *Univ. California Publ. Bot.* 3:56. 1907. *Bigelovia cooperi* A. Gray, *Proc. Amer. Acad. Arts* 8:640. 1873. *Haplopappus cooperi* (A. Gray) H.M. Hall, *Carnegie Inst. Washington, Publ.* 389:275. 1928.

Ericameria monactis (A. Gray) McClatchie, *Erythea* 2:124. 1894. *Haplopappus monactis* A. Gray, *Proc. Amer. Acad. Arts* 19:1. 1883.
- 3b. *Ericameria cooperi* var. *bajacalifornica* (Urbatsch & Wussow) Urbatsch, *Phytologia* 67:109. 1989. *Ericameria cooperi* subsp. *bajacalifornica* Urbatsch & Wussow, *Brittonia* 31:274. 1979.
- 4a. *Ericameria cuneata* (A. Gray) McClatchie, *Erythea* 2:124. 1894. *Haplopappus cuneatus* A. Gray, *Proc. Amer. Acad. Arts* 8:635. 1873.
- 4b. *Ericameria cuneata* var. *macrocephala* Urbatsch, *Madroño* 23:344. 1976.
- 4c. *Ericameria cuneata* var. *spathulata* (A. Gray) H.M. Hall, *Univ. California Publ. Bot.* 3:52. 1907. *Bigelovia spathulata* A. Gray, *Proc. Amer. Acad. Arts* 11:74. 1876. *Haplopappus cuneatus* var. *spathulatus* (A. Gray) S.F. Blake, *Contr. U.S. Natl. Herb.* 23:1849. 1926.
5. *Ericameria ericoides* (Less.) Jepson, *Fl. W. Mid. Calif.* 559. 1901. *Diplopappus ericoides* Less., *Linnaea* 6:117. 1831. *Haplopappus ericoides* (Less.) Hook. & Arn., *Bot. Beechey Voy.* 146. 1833; *non* DC., *Prodr.* 5:346. 1836. *Ericameria microphylla* Nutt., *nom. illeg.*, *Trans. Amer. Philos. Soc., ser. 2* 7:319. 1841.
6. *Ericameria fasciculata* (Eastw.) Macbr., *Contr. Gray Herb.* 56:36. 1918. *Chrysoma fasciculata* Eastw., *Bull. Torrey Bot. Club* 32:215. 1905. *Haplopappus eastwoodae* H.M. Hall, *nom. nov.*, *Carnegie Inst. Washington, Publ.* 389:258. 1928.

7. *Ericameria juarezensis* (R. Moran) Urbatsch, Phytologia 67:109. 1989.
Haplopappus juarezensis R. Moran, Trans. San Diego Soc. Nat. Hist. 15:154-155. 1969.
8. *Ericameria laricifolia* (A. Gray) Shinnars, Field & Lab. 18:27. 1950.
Haplopappus laricifolius A. Gray, Pl. Wright. 2:80. 1853.
Ericameria nelsonii (Fernald) S.F. Blake, Contr. Gray Herb. 52:26. 1917. *Bigelovia nelsonii* Fernald, Proc. Amer. Acad. Arts 36:505. 1901.
9. *Ericameria martirensis* Wiggins, Contr. Dudley Herb. 1:177. 1933.
Aplopappus martirensis (Wiggins) S.F. Blake, Proc. Biol. Soc. Washington 48:173. 1935.
- 10a. *Ericameria palmeri* (A. Gray) H.M. Hall, Univ. California Publ. Bot. 3:53. 1907. *Haplopappus palmeri* A. Gray, Proc. Amer. Acad. Arts 11:74. 1876.
- 10b. *Ericameria palmeri* var. *pachylepis* (H.M. Hall) Nesom, Phytologia 67:104. 1989. *Haplopappus palmeri* subsp. *pachylepis* H.M. Hall, Carnegie Inst. Washington, Publ. 389:267. 1928.
- 11a. *Ericameria parishii* (E. Greene) H.M. Hall, Univ. California Publ. Bot. 3:55. 1907. *Bigelovia parishii* E. Greene, Bull. Torrey Bot. Club 9:62. 1882. *Haplopappus parishii* (E. Greene) S.F. Blake, Contr. U.S. Natl. Herb. 23:1491. 1926.
- 11b. *Ericameria parishii* var. *peninsularis* (R. Moran) Nesom, Phytologia 67:104. 1989. *Haplopappus arborescens* subsp. *peninsularis* R. Moran, Trans. San Diego Soc. Nat. Hist. 15:152. 1969.
12. *Ericameria pinifolia* (A. Gray) H.M. Hall, Univ. California Publ. Bot. 3:54. 1907. *Haplopappus pinifolius* A. Gray, Proc. Amer. Acad. Arts 8:636. 1873.
- B. *Ericameria* sect. *Stenotopsis* (Rydb.) Urbatsch & Wussow, Brittonia 31:273. 1979. *Stenotopsis* Rydb., Bull. Torrey Bot. Club 23:617. 1900. TYPE SPECIES: *Haplopappus linearifolius* DC. (= *Ericameria linearifolia* [DC.] Urbatsch & Wussow). *Haplopappus* sect. *Stenotopsis* (Rydb.) H.M. Hall, Carnegie Inst. Washington, Publ. 389:156. 1928, in part.
1. *Ericameria linearifolia* (DC.) Urbatsch & Wussow, Brittonia 31:273. 1979. *Haplopappus linearifolius* DC., Prodr. 5:347. 1836. *Stenotus linearifolius* (DC.) Torrey & A. Gray, Fl. N. Amer. 2:238. 1842. *Stenotopsis linearifolius* (DC.) Rydb., Bull. Torrey Bot. Club 27:617. 1900.

Haplopappus interior Coville, Proc. Biol. Soc. Washington 7:65. 1892.

Haplopappus linearifolius var. *interior* (Coville) Jones, Proc. California Acad., ser. 2 5:697. 1895.

C. **Ericameria** sect. **Asiris** (H.M. Hall) Nesom, *comb. nov.* BASIONYM: *Haplopappus* sect. *Asiris* H.M. Hall, Carnegie Inst. Washington, Yearb. 25:342. 1926. TYPE SPECIES: *Ericameria nana* Nutt.

1. *Ericameria cervina* (S. Wats.) Rydb., *Fl. Rocky Mts.* 853. 1917. *Haplopappus cervinus* S. Wats., Amer. Naturalist 7:301. 1873.

2. *Ericameria nana* Nutt., Trans. Amer. Philos. Soc., ser. 2 7:319. 1841. *Haplopappus nanus* (Nutt.) D.C. Eaton, *Bot. King's Expl.* 159. 1871. *Chrysothamnus nanus* (Nutt.) J.T. Howell, *Fl. N.W. Amer.* 302. 1900.

3. **Ericameria obovata** (Rydb.) Nesom, *comb. nov.* BASIONYM: *Macronema obovatum* Rydb., Bull. Torrey Bot. Club 27:618. 1900. *Haplopappus rydbergii* S.F. Blake, *nom. nov.*, Contr. U.S. Natl. Herb. 25:545. 1925; not *Haplopappus obovatus* Phil. *Haplopappus watsonii* var. *rydbergii* (S.F. Blake) S.L. Welsh, Great Basin Nat. 43:295. 1983. I have not been able to evaluate Welsh's taxonomic judgment.

4. *Ericameria resinosa* Nutt., Trans. Amer. Philos. Soc., ser. 2 7:319. 1841. *Haplopappus resinosus* (Nutt.) A. Gray, *Bot. Calif.* 1:313. 1876. *Chrysothamnus resinosus* (Nutt.) J.T. Howell, *Fl. N.W. Amer.* 303. 1900.

5. **Ericameria watsonii** (A. Gray) Nesom, *comb. nov.* BASIONYM: *Haplopappus watsonii* A. Gray, Proc. Amer. Acad. Arts 16:79. 1881. *Macronema watsonii* (A. Gray) E. Greene, *Erythea* 2:74. 1894.

D. **Ericameria** sect. **Macronema** (Nutt.) Nesom, *comb. nov.* BASIONYM: *Macronema* Nutt., Trans. Amer. Philos. Soc., ser. 2 7:322. 1841. *Haplopappus* sect. *Macronema* (Nutt.) A. Gray, Proc. Amer. Acad. Arts 6:542. 1865. TYPE SPECIES: *Ericameria suffruticosa* (Nutt.) Nesom.

1. *Ericameria bloomeri* (A. Gray) Macbr., Contr. Gray Herb. 56:36. 1918. *Haplopappus bloomeri* A. Gray, Proc. Amer. Acad. Arts 6:541. 1865. *Chrysothamnus bloomeri* (A. Gray) E. Greene, *Erythea* 3:115. 1895.

2. **Ericameria compacta** (H.M. Hall) Nesom, *comb. nov.* BASIONYM: *Haplopappus bloomeri* A. Gray subsp. *compactus* H.M. Hall, Carnegie Inst. Washington, Publ. 389:199. 1928. *Haplopappus compactus* (H.M. Hall) L.C. Anderson, Great Basin Nat. 43:358. 1983.

3. **Ericameria crispa** (L.C. Anderson) Nesom, *comb. nov.* BASIONYM: *Haplopappus crispus* L.C. Anderson, Great Basin Nat. 43:359. 1983.

- 4a. *Ericameria discoidea* (Nutt.) Nesom, *comb. nov.* BASIONYM: *Macronema discoidea* Nutt., Trans. Amer. Philos. Soc., ser. 2 7:322. 1841. *Haplopappus macronema* (Nutt.) A. Gray, *nom. nov.*, Proc. Amer. Acad. Arts 6:542. 1865.
- 4b. *Ericameria discoidea* var. *linearis* (Rydb.) Nesom *comb. nov.* BASIONYM: *Macronema linearis* Rydb., Mem. New York Bot. Gard. 1:384. 1900. *Haplopappus macronema* (Nutt.) A. Gray var. *linearis* (Rydb.) Dorn, *Vascular Plants of Wyoming* 295. 1988.
5. *Ericameria gilmanii* (S.F. Blake) Nesom, *comb. nov.* BASIONYM: *Haplopappus gilmanii* S.F. Blake, Proc. Biol. Soc. Washington 52:97. 1939.
6. *Ericameria greenei* (A. Gray) Nesom, *comb. nov.* BASIONYM: *Haplopappus greenei* A. Gray, Proc. Amer. Acad. Arts 16:80. 1880. *Macronema greenei* (A. Gray) E. Greene, *Erythea* 2:73. 1894.
7. *Ericameria ophitidis* (J.T. Howell) Nesom, *comb. nov.* BASIONYM: *Haplopappus bloomeri* var. *ophitidis* J.T. Howell, Leaflets West. Bot. 6:85. 1950. *Haplopappus ophitidis* (J.T. Howell) Keck, *Aliso* 4:103. 1958.
8. *Ericameria suffruticosa* (Nutt.) Nesom, *comb. nov.* BASIONYM: *Macronema suffruticosa* Nutt., Trans. Amer. Philos. Soc., ser. 2 7:322. 1841. *Haplopappus suffruticosus* (Nutt.) A. Gray, Proc. Amer. Acad. Arts 6:542. 1865.
9. *Ericameria zionis* (L.C. Anderson) Nesom, *comb. nov.* BASIONYM: *Haplopappus zionis* L.C. Anderson, *Great Basin Nat.* 43:360. 1983.

Species Excluded

The following species will be treated as a separate genus (Nesom, *et al.* submitted).

Ericameria austrotezana M.C. Johnston

Ericameria diffusa Benth.

Ericameria parrasana S.F. Blake

Ericameria pseudobaccharis (S.F. Blake) Urbatsch

Ericameria purpusii Brandegees

Ericameria riskindii Turner & Langford

Ericameria triantha (S.F. Blake) Shinnery

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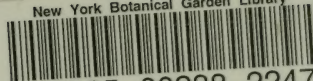
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